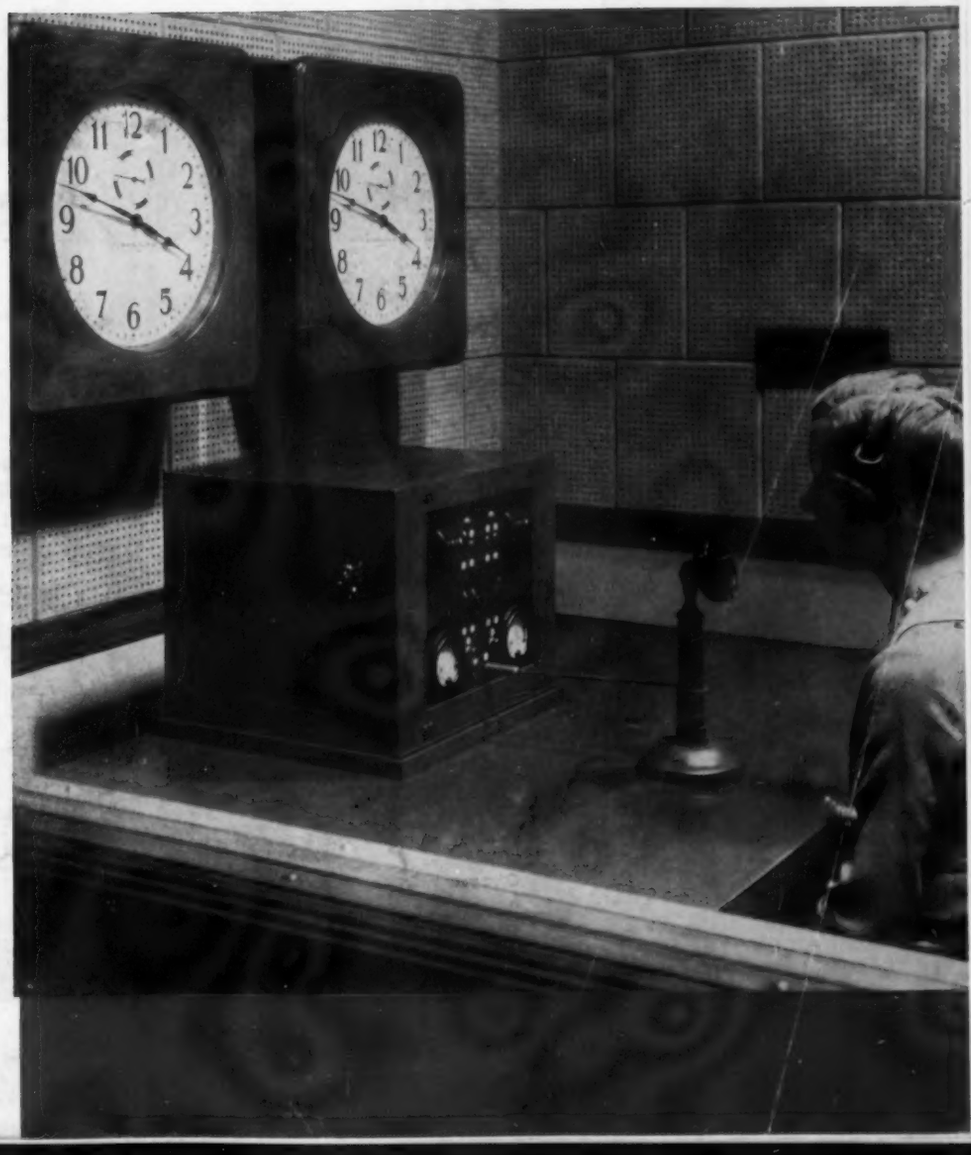
TELEPHONE ENGINEER

THE INTERNATIONAL TECHNICAL JOURNAL



COVER ILLUSTRATION
Time-of-Day Headquarters at Dearborn Exchange in Chicago
ARTICLE ON PAGE 28

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COMMISSION GIVES MORE ORDERS
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GOVERNMENT'S CRIME AGAINST UTILITIES
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SEPTEMBER, 1934

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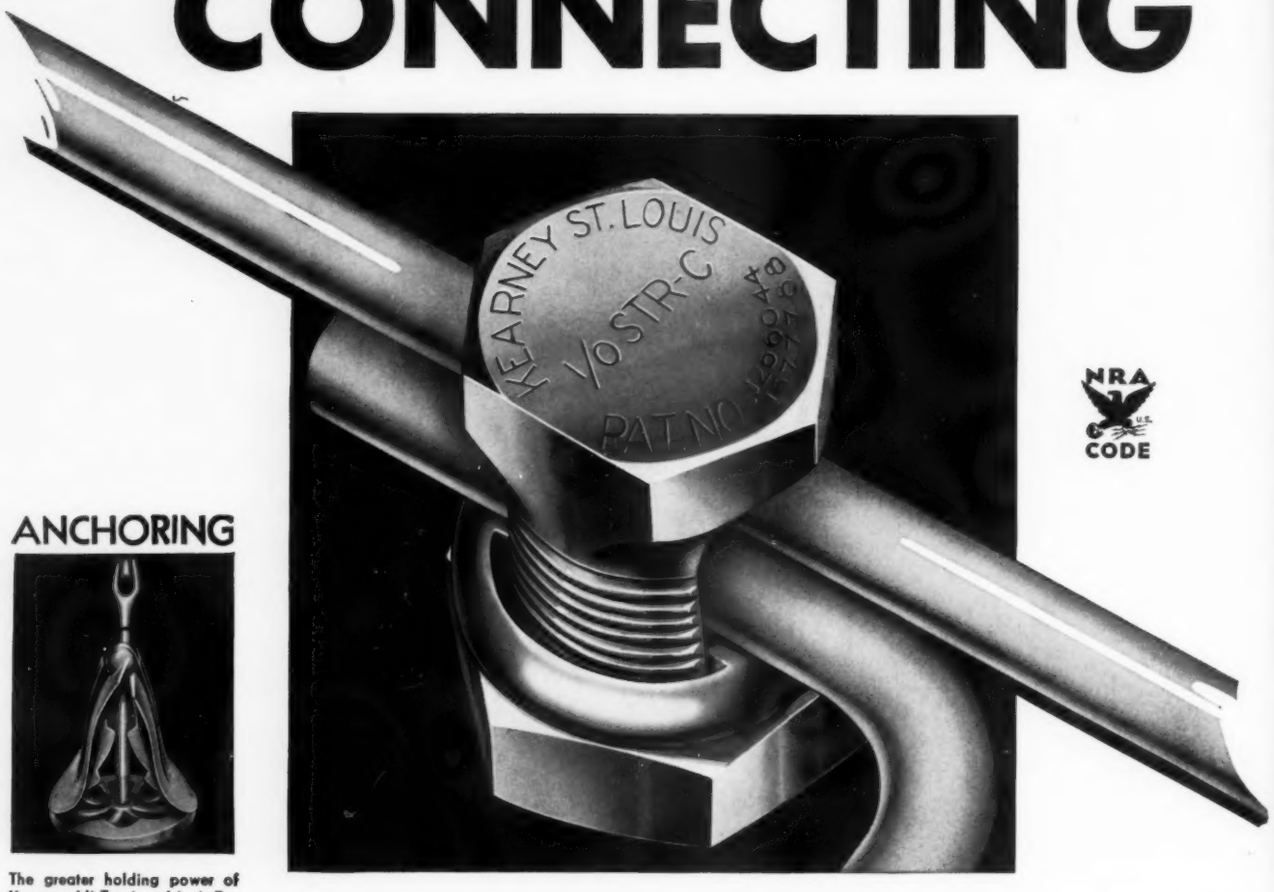

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ENTERED AS SECOND-CLASS MATTER, AT THE POST OFFICE AT MORTON, ILLINOIS, UNDER THE ACT OF MARCH 3, 1879.

What They Say About Your Business

Forty-nine years ago the telephone was even more of a curiosity than a luxury. The wealthy installed it in their homes for the same reason that they collected curios and antiques. * * * It is difficult to see how society could get along without the telephone today. * * * The explanation lies in the fact that the telephone constitutes a vital and complex system in a complex society.

It may only be a coincidence that there is one telephone and one automobile for every six people in the United States. And it may also be a coincidence that the history of the motor car paralleled that of the telephone in that the former also began its career as an invention, then became a curiosity and a luxury, and is now a necessity.

Those who have any reasons for concealing their age should never make the grave mistake of calling the telephone and automobile luxuries.—*St. Joseph (Mich.) Herald.* *R. C. R.*

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FUNCTIONS · IN · ALL

- By P
- By P
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EDITORIAL

Don't Let the Public Be Lulled to Sleep

There comes a report from Sweden that the government has taken over the control of railways and telephone and telegraph. Of course, the point of the story, as in all stories pertaining to government control, is that these industries return substantial revenues, and infers that taxes will be reduced. But, the report, as usual, fails to tell what generally happens in the long run when government assumes full control of public utilities.

We don't doubt for a minute that government experiences substantial revenues when it first takes over utilities, but we believe history will bear us out when we say that sooner or later government control means one of two things—inefficient and unsatisfactory service or substantial losses in operation. If substantial revenues are produced then one can bet they come as a result of rendering "cheaper" and inefficient service. If service is maintained on a level with that characteristic of private enterprise then you can safely bet that substantial losses are going to be incurred in operation.

The reason for this is because, sooner or later, where you find full government control or regulation you will find politicians and politics and, in most cases, where you find politicians and politics you find gross mismanagement, waste, corruption and neglect.

In both cases Johnny Q. Public takes the rap. He either gets inefficient service at low cost or he has to take care of financial losses incurred in giving the best of service through increased taxation. He is much better off with utilities under private enterprise, where, in the long run, he doesn't pay much more for quality service which government cannot begin to give at the same cost.

- By Politicians
- By Propaganda
- By Promises
- By Heavy Taxation

R. C. Reno

EDITOR

The Telephone Business As We See It

Back Your State Associations State telephone associations are and have been a very necessary and vital unit in the telephone industry. They have fought and helped defeat unfair legislation regulating our industry, they have been of tremendous help in protecting the interests of their member companies against government control and they have served as clearing houses for new telephone ideas and practices.

These are just a few of the many functions of state associations which make them so valuable to the industry. Every telephone operating company, whether large or small, should see to it that they receive the valuable services of their associations by paying immediately the nominal membership fees. After becoming members they should put their "shoulders to the wheel" and get behind the movements sponsored by their associations for the benefit of the industry as a whole.

Recently, the Texas Telephone Association announced a service in which every Texas operating company should be interested. H. M. Stewart, the association's wide-awake managing secretary, announces a plan of conducting an advertising exchange, which will collect and distribute constructive and instructive advertising plans and ideas to operating companies.

As Mr. Stewart says: "A number of companies are already recognizing the value of consistent and uniform advertising. There can be no doubt that well directed advertising is effective and profitable. The results are even greater as the spread is increased. Individual companies will not only profit by following systematic advertising policies, but the industry as a whole will be greatly benefited if all companies will maintain regular and standard advertising schedules."

We congratulate Mr. Stewart for his progressiveness. It behooves every member of his association to get behind him in this undertaking. For non-members, the value received from this advertising service alone will justify the small expenditure for membership in the association because if there ever was a time that telephone service and facts about the business should be presented to the public it is today. Local advertising is one of the best methods to obtain satisfactory results.

▲ ▲ ▲

Check On Your Season's Work In a few weeks construction programs will be well on their way to completion and NOW is a good time to begin checking up on results that have been accomplished and to note progress on uncompleted work.

If the work is progressing well, perhaps some additional project may be laid out before too late in the year. If it is lagging, there is yet time to put in additional effort so that the work will not drag on into bad weather, later in the season.

Early planning and continual checking of progress will produce results in the construction department that can be achieved in no other way.

Also now is the time to check over your stock of supplies and equipment. While Winter and its accompanying storms is quite a way off it would be well for telephone companies to check their stocks of poles, wire, cross arms, hardware and other material that goes to make sure that a reasonable supply is on hand for Winter. It is not difficult to tell how much of a stock you will have left at the end of the construction season and how much you should have on hand for emergencies.

▲ ▲ ▲

Get Reprints of Kloidy's Article George M. Kloidy's article, "Presenting The Facts To The Public", which appeared in the August issue of TELEPHONE ENGINEER is enjoying a wide-spread acceptance in the industry.

Reprints of the article have been ordered by a majority of the state telephone associations and by many individual operating companies. The groups obtaining reprints are certainly "on their toes" and they are to be congratulated for their progressiveness in furnishing telephone employees with information about the telephone business such as Mr. Kloidy gives in his article.

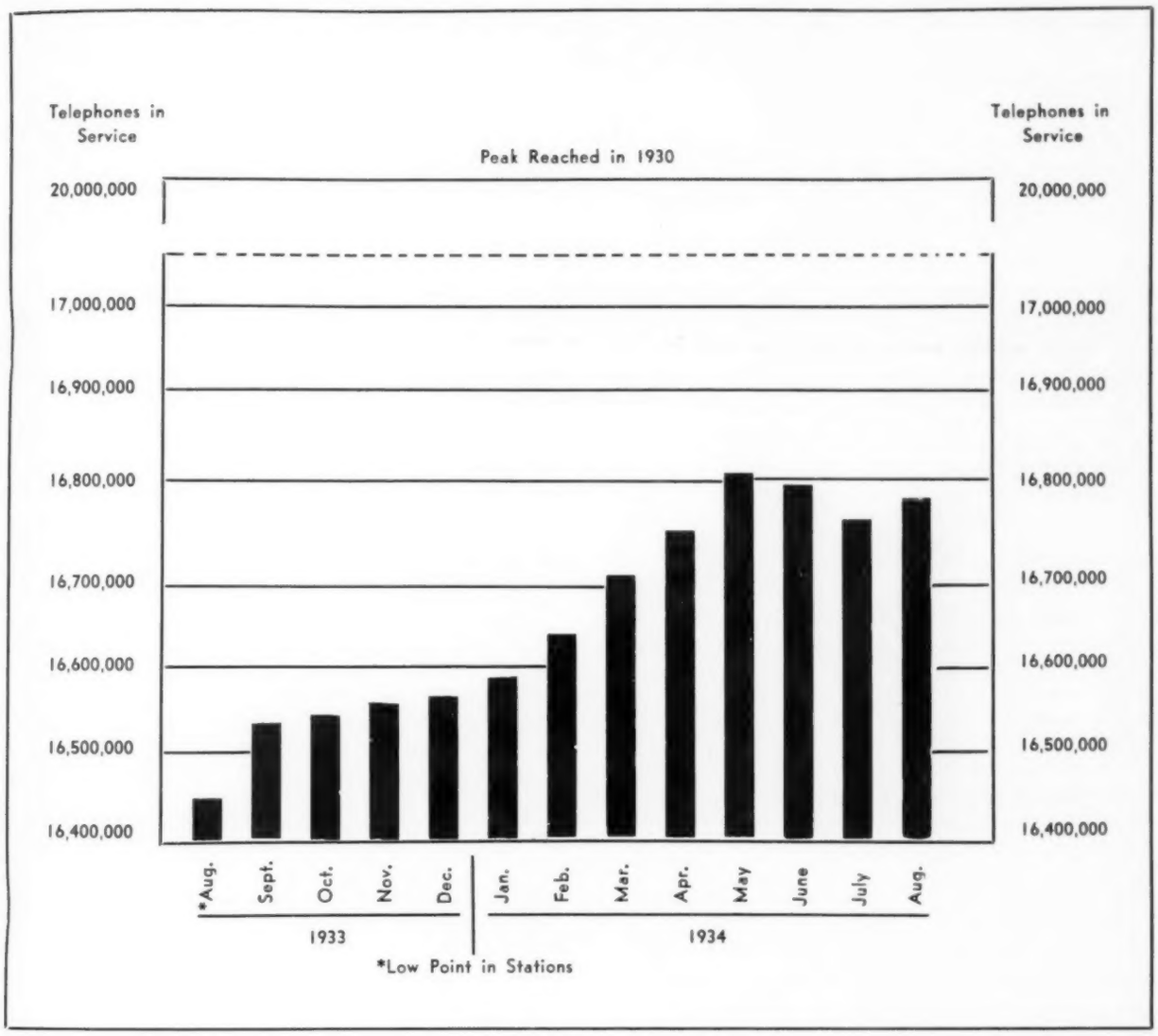
We urge state association executives who have not secured reprints and all operating companies to order some immediately and place them in the hands of telephone men and women so they can present the facts therein to the public. Reprints may be had in any quantity at small cost.

▲ ▲ ▲

Bruce Barton, eminent advertising and promotional specialist, in a booklet entitled "What I Have Learned About Life Insurance," given national circulation recently by life insurance companies, approves of public utility investments. He says:

"The public utilities have made a remarkably good record, as compared with other industrial enterprises, during the past four years. The life insurance companies rarely invest in the securities of holding companies, such as have been under some criticism, but in the primary obligations of operating companies, the bonds of which are a direct lien upon the properties producing the revenue. Here, again, there is rigorous selection of men especially trained in this field of investment."

Monthly Telephone Station Barometer



AS FORECAST in our August resume of telephone installations an upward swing is reported for last month, and it is predicted that each month during the balance of the year will show a still greater incline. Those in the telephone business realized that the June and July decline were seasonal and were not alarmed. Now that the summer season has passed there seems to be no reason for a letup in the upward trend.

The trend of business is upward and it is natural to suppose that telephone installations will follow, if indeed, they do not lead the procession. While drouths in the United States have been most severe, it is found that this parched area was in spots and did not cover the territory earlier reported. Where rains fell the farming sections are prosperous and in manufacturing centers an air of complacency exists except for strikes. Strikes, however, portend for prosperity rather than depression.

POWER NOISE REDUCTION IN TELEPHONE CIRCUITS

By
B. C. BURDEN
Transmission Engineer
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Lincoln, Nebraska

PART III

This is the third of a series of articles dealing with the reduction of power noise in telephone circuits. Preceding articles have discussed the basic causes of inductive interference, the theory of transposition as used in reducing interference, and complete transposition schemes suitable for application in the small and medium size Independent telephone plants.

This article will discuss how the factors of design, construction, and operation of telephone and power lines influence the amount of power noise set up in communication circuits.

Balanced and Residual Voltages and Currents

The voltage and current of a power line which is effective in introducing noise into communication circuits may be considered as being composed of two distinctly different components.

These two components are referred to as:

1. The Balanced Components (voltage-current).
2. The Residual Components (voltage-current).

The balanced voltage and current of a power line represents the normal condition that should prevail and the one that will result in minimum induced noise in paralleling communication circuits. On the other hand, the residual voltage and current of a power line represents the components that should be guarded against and kept at a minimum value, if excessive inductive interference is to be avoided.

Fig. 1 illustrates the difference between balanced and residual components. In this figure it will be noted that an accidental ground on wire No. 2 sets up a flow of current in the circuit consisting of transformer ground, line wire No. 2 and the accidental ground. This results in the line wire No. 2 carrying more current than line wire No. 1.

The algebraic difference in current carried by the two wires represents the residual current component. The balanced component is the normal current that flows disregarding that due to the accidental ground.

Reason for Inductive Severity of Residual Components

Now let us see why the residual current component is so much more severe from an inductive interference standpoint than the balanced component.

We have in the first article of this series stated that the current flowing in a power line induces noise in the paralleling telephone lines as a result of the circular magnetic lines of force radiated by the power Line. We also stated that the current in the two wires of a single phase power line flows in opposite directions, hence the magnetic field around one of the power wires is of opposite polarity (at any instant) to the magnetic field around the other wire. The magnetic field due to the two power wires being of opposite polarity, it was shown that the voltage induced in paralleling communication circuits would be the algebraic difference of that due to each power wire. In other words, the induced voltage resulting from one power wire would tend to neutralize or cancel that due to the other power wire. By transposing the two power wires it was shown that the net voltage induced in the communication circuit would be theoretically zero.

Now consider the case of the residual current. Inasmuch as this current flows over the line wire and back through ground (in the example given in Fig. 1) it sets up a magnetic field which is radiated by wire No. 2 and induces a voltage in any paralleling circuit. Inasmuch as wire No. 1 carries no residual current it will have no residual radiated field. The induced voltage due to the residual current will therefore be much greater than for a balanced current component of equal value. The residual current returning through earth to the transformer (see Fig. 1) sets up a magnetic field which will tend to neutralize the voltage induced in telephone circuits from the power line wire residual component. Fig. 2 illustrates the difference in the action of balanced and residual component.

Residual Voltage Components

The term "residual voltage" refers to the algebraic sum of the voltages to the ground of a single phase or three phase power line.

Figure 3 illustrates how an accidental ground on a power line would result in a maximum residual voltage.

Residual voltages like residual currents are much more severe in creating inductive interference than are the balanced voltage components. This is due to the absence of the neutralizing effect.

From what has just been said, it is obvious that we should keep the magnitude of our residual components in power lines as low as possible.

Residual voltages and currents may originate from any of the following

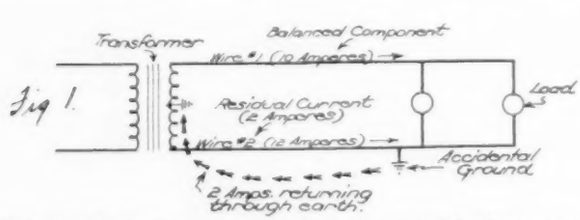

Fig. 1—Difference between balanced and residual components.

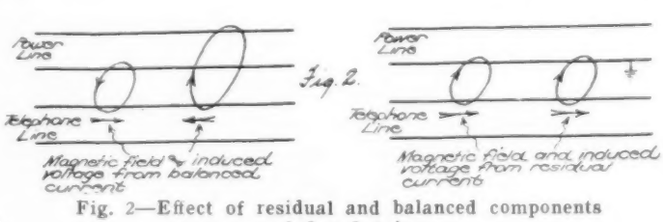
Power Line
Telephone Line
Magnetic field & induced voltage from balanced current
Power Line
Telephone Line
Magnetic field and induced voltage from residual currents

Fig. 2—Effect of residual and balanced components on induced noise.

sources:

1. Unbalanced capacity of the power wires to ground (particularly delta connected systems).
2. Unbalanced leakage to ground (particularly delta connected systems).

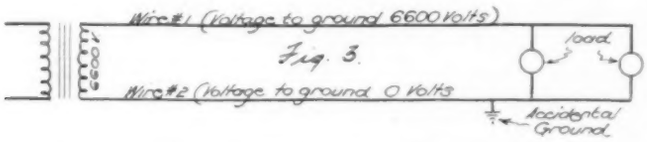

Fig. 3—Residual Voltage (ungrounded system).

3. Unbalanced loads between the neutral and the three phases of a grounded star connected system.
4. The introduction of the third harmonic and its odd multiples as residual current and voltage due to certain apparatus and connections employed on a grounded star connected system.

Taking each of the four principal sources of residual voltages and currents, let us see how such components can best be minimized.

Unbalanced Capacity of Power Wires to Earth

One of the most common sources of residual voltage is the unbalanced capacity to earth of the several wires of two or three phase lines (particularly three phase).

The capacity to earth of the several wires of a power line depends upon their size, distance from earth, and position on a crossarm or pole fixture with respect to other wires.

If only two wires are involved (single phase line) and those are symmetrically mounted in a horizontal plane, their capacity will be equal and the residual voltage from this cause will be zero.

With a three phase line it is not so easy to obtain a balanced capacity to ground. Power and telephone companies in connection with extensive inductive interference surveys and studies which have been made have determined that of the numerous possible configurations for three phase circuits that some are much to be preferred from the standpoint of their effect on capacity unbalance to ground.

Figure 4 illustrates several configurations and their relative merits from a capacity unbalance standpoint.

The problem of obtaining balanced capacities to ground on three phase systems is not as difficult as might at first seem. If a configuration having a fairly low characteristic unbalance is chosen and if the power line is transposed, so as to form a complete transposition barrel, at frequent intervals (about three mile barrels) a well balanced line will result.

Fig. 4.
Vertical Configuration (very bad) Approx index-100
Symmetrical Horizontal (Fair) Approx. index - 50
Equilateral Triangle (Good) Approx. index - 10

Fig 4—Several common 3-wire power line configurations.

The transpositions it should be understood balance the capacity of the several wires to earth by causing each wire to occupy, for the same distance, each of the three conductor positions.

The transposition barrel should be long enough to balance out the unbalance of the power line. Where power companies propose to construct three phase lines, portions of which will parallel telephone circuits, the telephone company involved should insist on the entire power line being transposed.

Three mile transposition barrels outside of the parallel should be recommended. Figure 5 illustrates a typical power telephone parallel and method of transposing the power line as recommended above.

Single Phase Extensions of Three Phase Lines

One of the most extreme examples of capacity unbalance and yet one which is quite common is that due to the extension of a single phase branch line from a three phase main line.

It is obvious that if a single phase extension is made from a three phase line, that the phase wire which is not extended will have a much lower capacity to ground than the wires which are extended.

This results in a high residual voltage which will be apt to set up severe inductive interference in paralleling circuits.

The residual voltage created by the

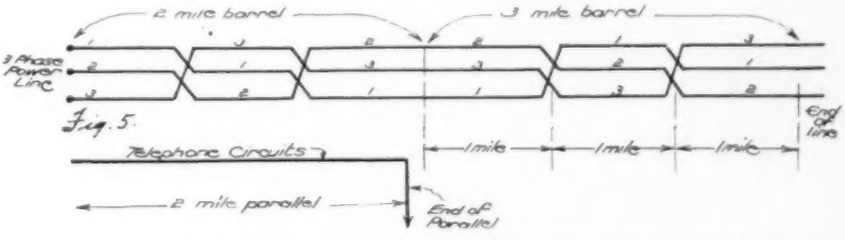

Fig. 5—Schematic of typical power line parallel and method of transposing power lines.

It is necessary to transpose three phase lines both where it parallels communication circuits and also outside of the parallel. Failure to transpose a power line outside of a parallel would result in residual voltages appearing within the single phase extension appears both in the single phase branch and the three phase main line.

The 1922 report of the General Joint Committee on Physical Relations Be-

(*Please turn to page 38*)

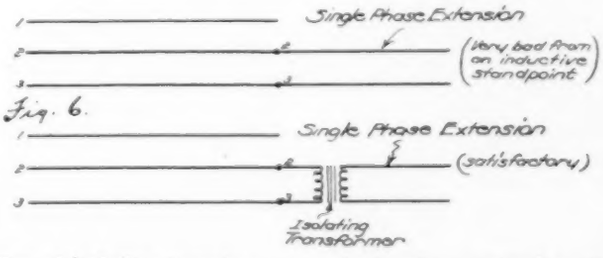

Fig. 6—Use of isolating transformer on single phase extension of 3-phase lines.

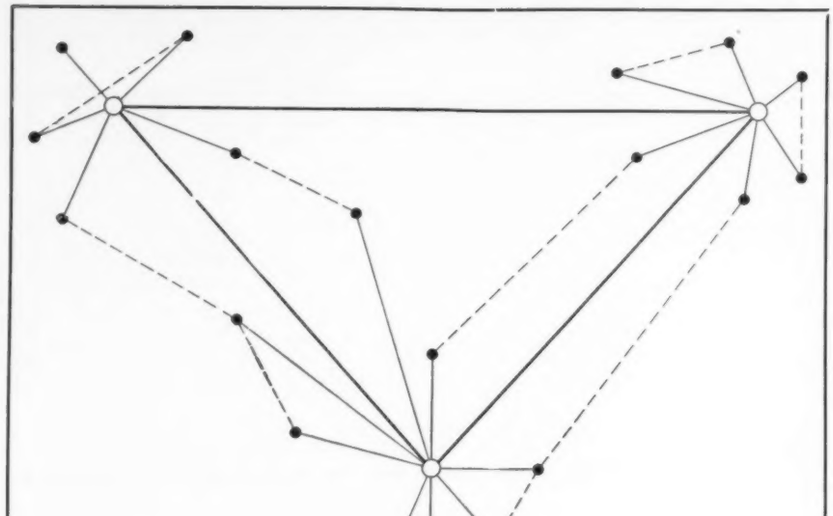
SOLID LINES - FUNDAMENTAL ROUTES OF GENERAL PLAN
DASHED LINES - SUPPLEMENTARY DIRECT CIRCUIT GROUPS
PRIMARY OUTLET
TOLL CENTER

Fig. 1—General toll switching plan—application in local company area.

General TOLL SWITCHING Plan

● This article is the final in the series on "Transmission Basis of Plant Design," which has been published in recent issues of **Telephone Engineer.** Mr. Osborne presented this paper before the American Institute of Electrical Engineers at the Toronto Convention in 1930.

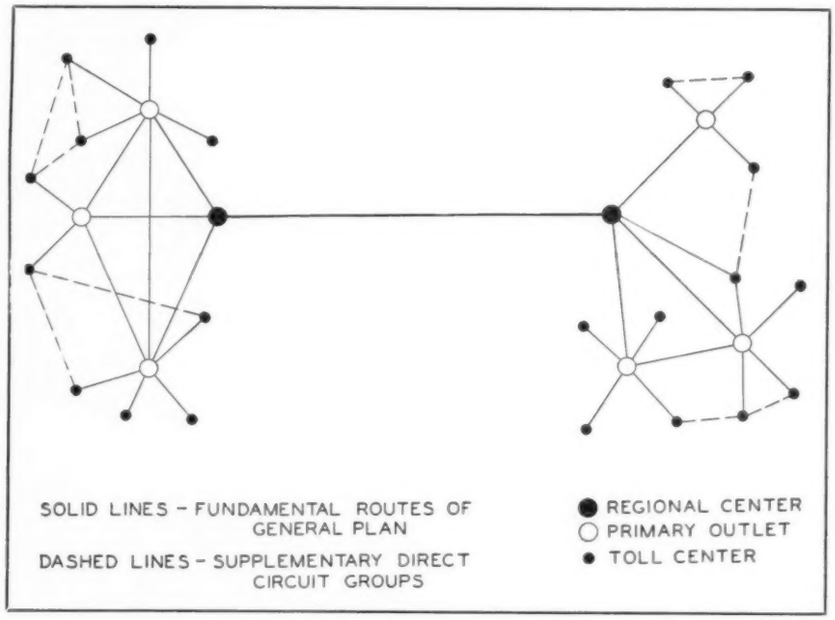
SOLID LINES - FUNDAMENTAL ROUTES OF GENERAL PLAN
DASHED LINES - SUPPLEMENTARY DIRECT CIRCUIT GROUPS
REGIONAL CENTER
PRIMARY OUTLET
TOLL CENTER

Fig. 2—General toll switching plan—illustration of interconnection of important switching offices throughout Bell System.

By
H. S. OSBORNE
American Telephone and Telegraph Co.

ON JUNE 25, 1915, telephone service was inaugurated between the Atlantic and the Pacific coasts of this country. This occasion marked a great step forward both technically and commercially. Before that time, the limit of practicable telephone transmission had been about 1,500 miles. The transcontinental service was made possible by the completion of numerous important developments and particularly by the perfection of telephone repeaters and of means for applying them to long wire circuits.

Until then the Pacific states and their neighboring states had been isolated telephonically from the eastern and midwestern parts of the country. The demonstration of commercially practicable telephone circuits across the continent gave a great impetus to the idea of universal service, that is the provision of a telephone plant such that telephone service could be given at commercially attractive rates between any two telephones in the country.

In the 20 years which have nearly elapsed since the opening of the first transcontinental circuits, the ideal of universal service has to a large extent been realized. Practically all the telephones of the United States and a large part of Canada now have provision for connection with the country-wide toll telephone network, more than 99 per cent being included. To achieve universal service, however, involves a great deal more. Circuits must be provided in such numbers and so arranged that connections between any two telephones can be established quickly and without too many intermediate switching points. Also, the telephone plant must be designed for such standards of transmission that these connections,

when established, permit satisfactory conversation. In general, the technical advances which have been made during the last 20 years to achieve the present standards of toll service have been described from time to time, and it is not within the scope of this paper to review them.

Associated with this development of the telephone plant has been a very rapid increase in traffic. Since 1915 the toll message in the Bell System have increased approximately five-fold. A striking characteristic of this growth is that the increase has been much more rapid for the longest lengths of haul than for the shorter lengths. The particularly rapid growth in the very long haul traffic has made it practicable to establish a considerable number of long haul circuit groups and has greatly assisted in the problem of handling satisfactorily calls between widely separated points. It has led to the condition today in which approximately 75 per cent of the long distance (Long Lines) messages are handled over direct circuits and a very considerable percentage of the remainder with only one intermediate switch.

The part of the business on which it is most difficult to give a high grade of service is naturally the scattering business between widely separated points. In these cases, each item of traffic, that is the business between two specific points, is relatively small but the number of items of such traffic is great. The number of messages involved in each item of traffic does not justify direct circuits and in very large numbers of cases it is unnecessary, in order to provide a connection, to make more than one intermediate switch. This applies at present to about 5 per cent of the long distance telephone business of the country. All measures of the quality of service—speech, accuracy and transmission—show that the difficulty of satisfactorily handling the service increases rapidly with the number of intermediate switches involved.

The conditions outlined above, together with the necessity for providing a considerable amount of new plant to take care of the increased traffic, form the background which made it both possible and important a few years ago to adopt a new fundamental arrangement for the layout of toll plant and the routing of toll messages. This is called the "General Toll Switching Plan."

General Toll Switching Plan

The purpose of this plan is to provide systematically a basic plant layout designed for the highest practicable standards of service consistent with economy, including speed, accuracy and directness of routing between any two points in the country and suitable transmission standards. This involves the layout of the plant in such a manner as to limit as much as practicable the number of switches required for providing a connection between any two telephones and the establishment of standards of design and construction providing satisfactory transmission over any route thus established. The plan is, therefore, of particular value in improving the service conditions of switched toll traffic, that is, traffic requiring the connection of two or more toll circuits.

The general features of the plan will be understood by reference to Figs. 1 and 2. Figure 1 shows the application of the plan to a limited operating area such, for example, as a state. Within the area are selected a small number of important switching points designated as "primary outlets." Each toll center is connected directly to at least one of these outlets and all primary outlets within the area are directly interconnected. This makes possible the interconnection of any two toll centers within the area with a maximum of two switches and within the part of the area served by one primary outlet, with a maximum of one intermediate switch.

(*Please turn to page 35*)

Fig. 3—General toll switching plan—location of points tentatively selected as regional centers and primary outlets in the United States and Canada.

COMMISSION Gives More ORDERS

● Federal Communications Commission releases Telephone Orders 5, 6, 7 and 8. Appoints attorneys and directors. Walker names secretary. United States Independent Telephone Association makes further interpretations.

SINCE the publication of the August issue of TELEPHONE ENGINEER the Telephone Division of the Federal Communications Commission has issued four orders to the telephone company. Orders 5, 6, 7 and 8. The texts of these orders follow:

Order No. 5

Pursuant to Section 213 of the Communications Act of 1934 (approved June 19, 1934), IT IS ORDERED that each carrier subject to this Act engaged principally in wire telephony, whose gross operating income per year exceeds $50,000, shall, on or before October 1, 1934, file with the Commission a verified report in duplicate showing:

1. Its corporate history, including
   A. its original capitalization, i. e., the number of shares of stock originally outstanding, and
   (a) how much thereof was sold or otherwise disposed of, and
   (b) what price per share was received therefor and of what the consideration specifically consisted
   B. whether said initial carrier acquired any other telephone system, company or corporation by merger, consolidation, purchase or otherwise, and, if so
   (a) the date of any such acquisition
   (b) the names of the persons, firms, companies, corporations or systems from whom such property was acquired;
   (c) the purchase price or consideration for any such merger, consolidation or other manner of acquisition, and
   (1) if by issuance of stock or bonds, the price at which the same was so issued;
   (d) duplicate copies of any contracts, leases, agreements or written memoranda in connection therewith.
2. Its service history, including:
   A. the territory initially served by the original carrier; the number of telephones originally installed in it, together with the monthly charge for each telephone so installed and operated at said time;
   B. the territory served immediately prior to the acquisition (if any) by the initial carrier, of each telephone system, company or corporation; the number of telephones in use at said time, together with the monthly charge for each telephone operated by the carrier reporting;
   C. the territory served after each and every acquisition or any other telephone system, company or corporation, whether by merger, consolidation, purchase or otherwise; the number of telephones then in use at said time, together with the monthly charge for each telephone then operated by the carrier reporting;
   D. each and every change made in the telephone tariffs charged by the reporting carrier from the beginning of its service to the date of this Order, and the dates when such changes became effective, the territories affected, and the number of telephones affected by each change.

Order No. 6

Pursuant to Section 202 of the Communications Act of 1934 (approved June 19, 1934) IT IS ORDERED that each carrier subject to this Act engaged in telephony, shall, on or before OCTOBER 1, 1934, file with the Commission a verified report in duplicate showing:

1. All services rendered free of charge to any person or corporation for the period from July 1, 1933, to June 30, 1934, together with
   (a) the names and addresses of such persons or corporations,
   (b) the character of such services.
2. All services rendered to any person or corporation at other than the regular rate for the period from July 1, 1933, to June 30, 1934, together with
   (a) the names and addresses of such persons or corporations,
   (b) the character of such services.
3. All services rendered by the reporting carrier for any individual, person or corporation in exchange for, or in payment of services rendered for such reporting carrier, except when such exchange of services is between common carrier;
   (a) the names and addresses of such persons or corporations,
   (b) the character of such services.

Order No. 7

WHEREAS the Interstate Commerce Commission has heretofore conducted an investigation to determine ACCOUNTING RULES FOR TELEPHONE COMPANIES in that Commission's Docket No. 25705, and

WHEREAS the Interstate Commerce Commission, on July 9, 1934, decided and rendered its report on ACCOUNTING RULES FOR TELEPHONE COMPANIES, and

WHEREAS the jurisdiction and authority to fix and promulgate accounting rules for telephone companies was transferred from the Interstate Commerce Commission to the Federal Communications Commission by operation of the Communications Act of 1934, and

WHEREAS representatives of certain state commissions or regulatory bodies having jurisdiction over intrastate service rendered by telephone carriers have indicated that they are desirous of being heard on said report of the Interstate Commerce Commission (decided July 9, 1934), and are desirous of filling exceptions and objections and of making suggestions with respect to said report of Interstate Commerce Commission,

IT IS THEREFORE ORDERED that representatives of the several states and of the commissions or regulatory bodies thereof having jurisdiction over telephone carriers therein, and all other parties at interest, shall have until October 1, 1934, within which to file exceptions or objections to the report of the Interstate Commerce Com-

mission, rendered in its Docket No. 25705, affecting accounting rules for telephone companies, or to suggest amendments or changes in such accounting rules for telephone companies.

IT IS FURTHER ORDERED that all such exceptions, objections and suggestions shall be filed in writing and fifteen copies thereof provided within the time herein specified.

ORDERED by the Telephone Division of the Federal Communications Commission, this the 16th day of August, 1934.

ORDER NO. 8

Pursuant to Section 308 (b) of the Communications Act of 1934, IT IS ORDERED that every radiotelephone common carrier (except those operating exclusively in Alaska) which holds a point-to-point telephone station license in the fixed public service shall file a supplementary statement with each application for renewal of license for the next license period only, showing:

(a) The name of the organization operating the other end of each circuit designated in the license sought to be renewed and (to the best of applicant's information and belief) its relation to other communications operating or holding companies or administrations in other countries.

(b) the number of paid public messages and the average chargeable time of such messages transmitted during the month of July, 1934, to each point specifically designated in the license sought to be renewed, showing (1) the number originating in the United States, and (2) the number originating outside of the United States.

(c) the name of each point of communication specifically designated in the license sought to be renewed to which no paid public messages have been transmitted during the license period, prior to the date of this order.

(d) the name of each point of communication specifically designated in the license sought to be renewed, to which paid messages were transmitted at some time during the license period but to which no such paid public correspondence was transmitted during the month of July, 1934.

(e) the reason for not handling paid public messages with each point that may be listed under (c) or (d) above.

(f) the reason for desiring to continue inactive points of communication in the license.

Association Gives More Interpretations

Many telephone operating companies still find themselves "in the dark" when it comes to analyzing the eight orders sent out by the Telephone Division of the Federal Communications Commission and to making a decision as to whether or not they are exempt from the orders. Many companies have written to the United States Independent Telephone Association for interpretations of the orders, which the Association has given in the following letter dated September 4:

"As the Federal Communications Commission in issuing its orders to telephone companies has sent these orders to all companies, many of our members are asking what reply should be made and whether any of the orders apply to all companies. Under date of August 2 the Association stated its interpretation of the Act and stated companies that can classify as "connecting carriers" under the Act are exempt from complying with orders 1 to 3 inclusive (all that had been issued to that date).

"Since our letter of August 2 was sent out, four other orders have been issued by the Commission that make it advisable for us to give a more detailed explanation and an opinion as to what companies are exempt from all orders so far issued and what if any, orders are applicable to all companies.

"From letters that we have received we think many of our companies have not understood the application of this exemption. Some have thought that only those companies are exempt that do only an intrastate business and that any company doing interstate business is under the Federal Commission. This is not the case as the Act very clearly states that any company that handles interstate calls entirely by its own facilities is under the Act, and a company that must make use of the facilities of another company in completing interstate messages is not under the Act. Practically every telephone company engages in interstate commerce at some time. Whenever it handles an interstate message it is engaged in interstate commerce; but whether it is engaged in interstate commerce is not the test of exemption. The test is, as we have just stated, whether it can complete an interstate toll message entirely with its own facilities.

"No interpretation of the Act or explanation of the Commission's jurisdiction has been issued by the Commission.

"Paragraph (b) of Section 2 of the Act says: "Subject to the provisions of section 301, nothing in this Act shall be construed to apply or to give the Commission jurisdiction with respect to (1) charges, classifications, practices, services, facilities, or regulations for or in connection with intrastate communication service of any carrier, or (2) any carrier engaged in interstate or foreign communication solely through physical connection with the facilities of another carrier not directly or indirectly controlling or controlled by, or under direct or indirect common control with, such carrier; except that sections 201 to 205 of this Act, both inclusive, shall except as otherwise provided therein, apply to carriers described in clause (2)."

"As Section 301 applies only to radio transmission, this paragraph may be restated as follows: Only Sections 201 to 205, inclusive, shall apply to telephone companies described in clause (2) of paragraph (b) of Section 2 of the Act. Therefore, orders based on the authority given the Commission by other sections do not apply to such companies as are thus exempt and only orders issued under Sections 201 to 205 inclusive do apply; and the orders issued under these latters sections apply only to *interstate* traffic and practices.

"We then can analyze the orders thus:

(1) Issued pursuant to Section 203 (a) of the Communications Act.

(2) Issued pursuant to Section 211 (a) of the Communications Act.

(3) Issued pursuant to Section 215 (b) of the Communication Act.

(4) Issued pursuant to Section 215 (b) of tre Communication Act.

(5) Issued pursuant to Section 213 of the Communications Act.

(6) Issued pursuant to Section 202 of the Communications Act.

(7) Relative Accounting Rules.

Orders 1 and 6 are the only ones based on Sections 201 to 205 inclusive. Order 1 requires the filing of schedules of charges for interstate messages and the classification, practices and regulations affecting such charges. It is issued under Section 203 (a) which says every common carrier, *except connecting carriers*, shall file schedules. So Order 1 does not apply to companies exempt under Section 2 of the Act. Order 6 is issued under the authority given the Commission under Section 202 of the Act. No company is exempt from the requirements of this section and, therefore, no company is exempt from Order 6. But the order can refer only to free services given in interstate tolls of discriminating practices in connection with *interstate* business, or *interstate* services rendered in exchange for services, etc., for paragraph (b) of Section 221 says:

"Nothing in this Act shall be construed to apply, or to give the Commission jurisdiction, with respect to charges, classifications, practices, services, facilities, or regulations for or in connection with wire telephone exchange service, even though a portion of such exchange service constitutes interstate or foreign communications, in any case where such matters are subject to regulation by a State Commission or by local governmental authority."

"Order 7 concerns the revision of the Interstate Commerce Commission's System of Accounts, which has now become the system of accounts of the Federal Communication Commission. In 1933 some of the State Commissions objected to some parts of this system of accounts. A hearing was held at which opportunity was given these Commissions and the telephone companies to express their views on the parts of the system of accounts criticised by the State Commissions. No order was issued by the Interstate Commerce Commission modifying the account, but instead a detailed report was made making certain recommendations as to some changes and opposing others. This report was passed on to the Federal Communications Commission and is now before them for action. Order 7 provides opportunity for the companies and the State Commissions to file opinions on the report, and, therefore, on the proposed changes in the accounting system.

"The System of Accounts has been prescribed only for Class A and B companies, that is, companies having over $50,000 annual revenues; so that those companies are the only ones immediately concerned. While the Federal Commission does not have jurisdiction over all A and B companies, yet all are interested in this procedure because probably the final decision will result in an accounting system that will be acceptable to both the Federal and State Commissions and, therefore, applicable to all companies.

"The Association through its Accounting Committee is giving careful consideration to the recommendations of the report and will take such action in behalf of the Association as seems best for our member companies. No date for a public hearing has been set, and will not be until after these opinions have been filed. We shall keep you advised.

"A number of companies have written asking why if they are exempt under the Act the Commission continues to serve them with the various orders. The Commission does not know which company is under the Act and which is not. It was our suggestion that a company that knows itself to be exempt need pay no attention to the Commission's orders. We now think it is advisable for every company to notify the Commission that it is exempt, stating that it comes under the exemption clause of paragraph (b) of Section 2 of the Act, as it is not able to complete an interstate message without making use of the toll lines or exchange facilities of some other company. By means of such statements, the Commission in time will be able to check all companies and in time serve its orders only on those companies that are under its jurisdiction. One such notice from the company to the Commission should be sufficient."

APPOINTS ADDITIONS TO LAW DEPARTMENT

The Commission on September 4 announced the following additions to its Law Department, of which Paul D. P. Spearman is General Counsel:

COLONEL DAVIS G. ARNOLD—Colonel Davis G. Arnold, of Washington, who has joined the staff of the Federal Communications Commission as attorney examiner, was born in Providence, R. I. He received his education in the public schools of Providence and Cheltenham Military Academy. He was admitted to the Rhode Island Bar in 1906, and continued in the general practice of law in that state until called to duty on the Mexican border in 1916.

While in the government service in Washington since 1923, he has acted as counsel to the senate committee that investigated the Veterans' Bureau, later becoming assistant director, national guardianship officer, and assistant solicitor in the Veterans' Administration, formerly the Veterans' Bureau. In this work he has served as special assistant to the attorney general, and as special assistant to United States attorneys in many jurisdictions in the prosecution as well as defence of provisions of the World War Veterans' Act.

MELVIN H. DALBERG—Melvin H. Dalberg of New York, was born in St. Louis, Missouri. Educated at Columbia University, both College and Law. Has been practicing law in New York for 30 years. Was Assistant Tax Commissioner of the City of New York under former Mayor George B. McClellan.

In 1906-07, Mr. Dalberg acted as a member of a commission appointed by the New York State superintendent of insurance which had charge of the conduct of the election of trustees of the Mutual Life Insurance Co. and which held hearings involving the validity of ballots, for upwards of six months. Mr. Dalberg has on numerous occasions been appointed Referee in litigations by justices of the New York Supreme Court.

JOHN P. BRAMHALL—Mr. Bramhall, a lawyer, has been a resident of Washington for the past 15 years. He practiced his profession in Missouri, and for seven years was counsel for the Street Railway System of Kansas City, Mo.

Mr. Bramhall came to Washington to accept an appointment as chief counsel for the federal government in the prosecution of cases arising out of the military and naval operations in the World War. He was engaged in this activity in the United States and in Europe for five years, during which time he acted with the powers of a special assistant to the attorney general. In 1923 Mr. Bramhall, having completed his work for the government, entered the practice of law in Washington as the senior member of the firm of Bramhall and McCabe, with offices in the transportation building.

ALBERT E. STEPHAN—Albert E. Stephan, LL.B. Harvard Law School, A.B. Wesleyan University, grad. Central High School, Washington. Examiner, Interstate Commerce Commission, 5 years. Attorney for commission in national investigation of motor transportation. Attorney for Federal Co-ordinator of Transportation, one year. Special Assistant to Senate Committee on Interstate Commerce helping to draft Communications Act of 1934, Emergency Railroad Act of 1933, Railway Labor Act, Railroad Pension Bill and other legislation.

A. V. DALRYMPLE—Born Lexington, Texas. Graduate of Caldwell (Texas) High School, Sam Houston Normal Institute, Valparaiso University, LL.B., Georgetown University (Foreign Trade Course). LL.D. Ohio Northern University, LL.D. Lincoln Memorial University.

Teacher, Texas and Philippine Islands, Division Supt. of Schools, Philippine Islands, Prosecutor of Narcotic and revenue cases, Philippine Islands, Governor, Amburayan Province, Philippine Islands.

Spanish-American War: U. S. Navy with Admirals Sampson and Schley. World War: Major U. S. A. in Washington and France, Prepared enthnographic maps defining new boundaries of Poland and Slavonian countries, Detailed to Peace Conference, Paris. Chief Attorney, Board of Contract Adjustment, settling war claims; Private legal practice, Texas and California.

MISS ANNIE PERRY NEAL—Born in Louisburg, N. C., and received her elementary education there. Graduated with A.B. degree from Sweet Briar

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How to Run BETTER Sales CONTESTS

● Acknowledgment is made to Harper & Brothers for permission to pre-print from the author's book, "How to Run Better Sales Contests," August 1934. Send to **Telephone Engineer** a self-addressed envelope for your copy of the "Perfect Contest Check List," a 48-notch yardstick for measuring the perfect contest.

By
M. ZENN KAUFMAN

M. Zenn Kaufman

Installment Four
SCORING PLAN

SCORING is the vital link between the contest and the employee. Of all the factors that enter into the planning of a contest the scoring is the most important. If your scoring plan is poor, your contest is doomed. A good scoring plan is one that is aimed at the right target simply and fairly, but first it must be aimed right.

What are you aiming at? That is the question that requires you to retrace to where you first planned your contest, for your scoring policy in awarding points or credits revolves around the object or goal of the contest. Your scoring plan is the thing that provides the emphasis at the point where you want the pressure brought.

There are four principal bases on which you might score your contest: 1. Straight dollar volume or total sales. Increase can be scored either on the number of dollars of increase or the number of per cent of increase. 2. Unit of sales basis. This is particularly adaptable for focusing a contest on a special kind of sale such as directory listing, reinstallations, new installations, P.B.X. facilities, new services, etc. 3. Variable scale bases. This permits of giving extra credit for all types special performance; for instance, steady weekly increase in business. In a regular contest run on basis No. 1 you might include special points for special kinds of business. Additional points might be included for getting testimonial letters or for being the high man in any one week of the contest. Demerits can also be given for failing to meet certain specified standards.

A scoring plan must be simple. If your employee needs a slide rule and a knowledge of elementary algebra to know where he stands in your contest then your scoring plan is no good. Two seconds should be enough time for a man to see just where he stands and know exactly why. If a man can figure out his score easily he will do it often and thus maintain his own interest in the contest. Another value of simple scoring is that the man or woman will know that the contest is fair and that they have a chance to win, whereas if the calculation is difficult many of them will always imagine that somebody is going to do them an injustice. Of course the complexity of a scoring system can vary with the calibre of the force; if the men are highly intelligent a complicated system may work, but in a great number of cases extreme simplicity is essential.

Be fair; if a scoring plan seems unfair to the men they will grow resentful quickly and lose interest in the contest. The scoring plan must suggest to the men that everybody has a sporting chance to win and that nobody is placed in a losing pocket. Appearance of unfairness is almost as fatal as unfairness itself.

Setting Quotas

Setting quotas will never be an entirely scientific job. It will always be hard to please any entire group of men. Some one will always think he is getting a bad break. With this in mind I suggest that when in doubt lean toward the little fellow.

Be sure to take current conditions into account in setting quotas for your contest. A certain building development in one section will give somebody an unfair advantage and put your entire group of men into the wrong moral condition. Analyze local conditions very carefully with respect to the season for at certain times of the year migration to vacation points will affect the business possibilities of any one section.

Quotas must not only be fair on a competitive basis but must also be reasonably obtainable on the part of the individual men. If a man has no chance of reaching his quota he is not going to take much interest in the contest. If it is physically impossible to win without an earthquake your plan is no good, but if it is possible to reach the quota with a reasonable amount of extra effort then your quota is all right. Arthur Swain uses as an illustration a man who has been asked to touch the ceiling. It can't be done and he knows it when he is approached, but if you ask the same man to touch the top of the doorway he sees the possibility of accomplishing it, extends himself and does it.

Team scoring can add a lot to a contest. Of course when you play one

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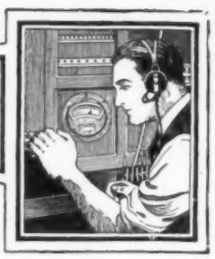
LINE and DESK

Ray Blain, A. I. E. E., Editor



Q.—What is meant by "Quadded Cable"?

A.—This is cable in which some or all of the pairs are formed into groups or quads of two pairs which are transposed to permit the use of phantom circuits.

Q.—When connecting protectors on main frames should the permanent cable be on the left or right side?

A.—The cable should always be on the left and the jumpers on the right side. The right side is more convenient to work on and the cable is connected but once on the left side while many different jumpers may be connected to each pair on the right side during the ordinary life of a main frame.

Q.—What method is recommended for removing the deadend type of drop-wire clamp from parallel wire?

A.—They may be removed fairly easy by gripping the wedge close to the sleeve with a pair of diagonal cutting pliers and rocking the wedge loose by using the end of the sleeve as a point of leverage.

Q.—When a telephone cable is strung on poles jointly used with a power company should the down guys be equipped with strain insulators?

A.—It is generally considered standard practice to cut strain insulators in all telephone guys where the jointly used poles supporting electric light, power, or trolley wires, which carry a voltage of 300 or greater to ground.

Q.—What use can be assigned to duck bill pliers in the telephone exchange?

A.—They are convenient for many purposes where long nose pliers cannot be used to advantage. The duck bill plier with smooth jaws is very useful in adjusting relays especially on a bench.

Q.—What is recommended to fill holes in the key shelf of a switchboard caused by moving operators' dials?

A.—Plastic wood will be found entirely satisfactory for this purpose. It can usually be stained the same color of the key shelf after it is rubbed down to a smooth and even surface.

Q.—When should small drive rings be used in preference to milonite nails for inside house wire?

A.—When more than one wire is being run for a distance along the same route and the appearance of the drive rings are not considered objectionable they are generally preferable. The rings have the advantage that more wires may be added to the run easily if ever necessary.

Q.—What is the estimated cost per foot of 2-way clay conduit in place?

A.—This is a most difficult question to answer accurately as the cost will be determined almost entirely by local conditions. One company estimates that it costs them an average of 25 cents per lineal foot to place 2-way clay conduit not under pavement. The same concern estimates that it costs them $0.445 per sq. foot to remove and replace concrete pavement and $0.385 for asphalt pavement.

Q.—When running a cable horizontal along one side of a building how far apart should the cable clamps be spaced?

A.—About 17 or 18 inches will ordinarily be satisfactory for 100 pair cable or smaller and about two feet apart for larger cables.

Q.—What is considered an exposed telephone line?

A.—This can generally be considered a substation or private branch exchange line exposed to possible contact with a foreign circuit of more than 250 volts potential or to lightning potential. All other lines are considered unexposed and do not ordinarily require protection.

Q.—Is a wire Chief's testing cabinet considered necessary for use in a common battery exchange of 300 subscribers' lines?

A.—It is not believed that any telephone exchange, even though it be small, can well afford to be without proper testing equipment. When lines are reported in trouble and not tested the troubleman must work more or less by guess which makes the clearing of trouble slow and expensive. Many times lines reported in trouble can be tested and cleared in the central office without getting the troubleman out on the line at all. The purchase of adequate testing equipment will prove a worthwhile investment for any telephone company.

Q.—Should the running of drop wire parallel to cable be permitted in an up-to-date aerial plant?

A.—To reduce the number of distributing terminals on an aerial cable it is sometimes permissible to attach drop wires to poles and parallel cable. However, it is not ordinarily considered good practice to have more than two drop wires parallel the cable more than two spans.

Q.—What scale should ordinarily be used in drawing maps of exchange cable systems?

A.—This will depend to a great extent upon the size of the exchange being mapped and the details to be shown. If all streets, alleys, buildings, etc., are to be indicated a scale of 1 inch to 100 feet is desirable. When the size of a single drawing to this scale would be prohibitative it may be made in sections. Most people prefer that large plant drawings be made on a scale of 1 inch to 200 feet with inserts, when required, to give more detail. On small drawings to indicate a lot of detail, a scale of 1 inch to 50 feet is generally considered desirable.

Q.—What is the resistance of modern ringing coils in common battery telephones?

A.—Modern ringers vary from 500 to 2500 ohms per pair according to the type of instrument and ideas of the manufacturer. Present day practice generally requires that the ringer coils be left bridged across the line during conversation and the windings of the magnets must be designed not only with respect to the ringing currents used but also with respect to the voice currents. As the ringer forms a shunt path for the voice currents in order that they may not be shunted out the ringer coils are wound on long cores, with many turns in order to give them as high impedance as possible to voice currents. Ringing current passes through with enough freedom to

(*Please turn to page* 38)

Government's CRIME Against UTILITIES

● Telephone men should be interested in this article reprinted from "Forbes", June 15, 1934. The article deals with the Federal Government's plan of going into the power field and tells just what this activity means to stockholders of electric utilities.

HOW long will the millions of frugal individuals and families who have invested their savings in public utilities remain silently submissive to the crimes the Government is committing against their properites?

Outright gifts totalling millions are offered cities, towns, communities to induce them to ruin local utility plants by erecting duplicate municipal facilities—the remaining 70 per cent of the cost, over the 30 per cent cash donation, is proffered by the Federal Government at four per cent.

To make sure that the civic competition will be unfair, such plants go scot-free of the heavy taxes imposed upon plants owned by investors—also free from regulation and from NRA burdens.

If this isn't **de facto** confiscation of private property without fair compensation, what is it?

Not content with such destruction of the rights and savings of investors, the Federal Government, despite its staggering deficits and dire need for striving to keep public expenditures within the ability of taxpayers to meet the obligations, is sponsoring power-manufacturing projects estimated to cost in excess of two billion dollars—Tennessee Valley, Columbia Basin, California Central Valley, Boulder Canyon, Tri-County Power and Irrigation District, Seminoe Dam, Loup River, Platte Valley, etc.

This colossal burden is to be fastened on already over-burdened taxpayers, despite the fact that existing facilities are amply adequate to furnish all power needed now or likely to be needed in the measurable future.

Ponder the fatuous statesmanship which, during a period of acute economic distress and shocking governmental deficits, gratuitously loads an average of $100 additional debt on every family in the land!

Over-produtcion was blamed for having brought on or aggrevated the collapse in 1929. It has been regarded by the Government as so vitally important to put a definite end to over-production that millions and millions of dollars of taxpayers' funds have been ladled out to farmers as rewards for wholesale destruction of crops, for plowing-under cotton, for drastically curtailing planting of new crops and—acme of statesmanship!—for nationwide slaughtering of pigs guilty of failing to practice birth-control.

Over-production of manufactures was roundly condemned. Over-production by farmers is officially accounted fatal to reachieving prosperity.

But over-production of electric power facilities is so extremely desirable, so praiseworthy, so noble, that our Federal tax leviers are compelling you and me to dig still deeper into our pockets and hand over money to them for the purpose of over-producing power-manufacturing facilities!

If this isn't an economic, a social, a political crime, what is it?

Enlightened business concerns cultivate their customers, whose money they get.

The Federal Government deliberately wipes out its customers, those who have been handling over millions to it, in taxes. Not only is it carrying on vast power projects of its own, but it is moving heaven and earth to get municipalities to follow its shortsighted example.

Taxes paid by electric utility companies have soared from three millions in 1902 and 73 millions in 1922 to approximately $230,000,000 last year; and, on top of this, a new Federal tax of three per cent on total revenue has been foisted upon them.

Yet the politicians are out to kill the goose that lays these golden eggs.

Meanwhile, in face of multiplying taxation and greatly increased cost for labor and fuel under the NRA and for endless and countless questionnaires and investigations, utility rates are continuously falling: The average revenue per kilowatt hour for domestic service was 6.03 cents in 1930, 5.78 cents in 1931, 5.58 cents in 1932, 5.49 cents in 1933, and 5.44 cents for the twelve months ended last March.

Contrast that record with the rise in the cost of government, Federal, State, county, municipal, in recent years. Utilities are run by business men; governments are run by politicans.

But now the politicians are itching to run almost everything on the face of the continent.

How enamored communities are of having politicians run utilities is vividly reflected by a **decrease** in the number of municipal electric systems from the beginning of 1928 to the end of 1932 of no fewer than 396—this in the teeth of the perfectly natural efforts of local political officeholders to preserve their jobs.

What is the gravest problem confronting the National Association of Mutual Savings Banks, the organization charged with safeguarding those who have saved something? Let it reply: "By far the gravest problem which confronts not only this organization but every large investor in public utility bonds, is the serious situation brought about by the attitude of Government officials who favor the use of vast sums of public money in developing plants which duplicate existing properties and jeopardize the safety of securities."

When the Government commits crimes against "utilities" it commits crimes not only against all owners of shares or bonds of utility companies, but against wholly innocent savings bank depositors throughout the nation and also against every one of our 60,000,000 owners of insurance policies.

How long will fair-minded citizens permit politicians to pursue their utility-baiting madness without protesting against the contemptuous rampling upon and destruction of their rights and property?—Forbes, June 15, 1934.

From about 300 telephones and one switchboard in 1884 to more than 67,000 telephones in 1934, with eleven central offices, is the record of Dallas, Texas, during a half century.

"At the Next TONE SIGNAL The TIME WILL BE . . . . . "

AT THE next tone signal the time will be . . . twelve-forty and one-quarter. The woman slowly placed the receiver back on the hook. Well, it was all over with. She had missed the "Century." Missed the boat. Missed George. There was no alternative. *At the next tone signal the time will be . . . twelve-forty and one-half.* Something unconquerable about time. Something magnificent. Going on and on into—what?

And to a civilization dependent on time, a pleasant, untroubled voice sends metronomic announcements every fifteen seconds. The late sleepers, in search of reassurance, call CAThedral 8000, eager to see if they must forego breakfast, or if there is time for ten more winks. The punctilious and punctual, in Chicago and its suburbs, dial or ask for CAThedral 8000.

What is CAThedral 8000? Where is it?

It is the number customers call to get the time-of-day service given out by the Illinois Bell Telephone Co. from a soundproof room in Dearborn Office, on the fifth floor at 131 West Washington Street, Chicago. The room resembles that of an announcer in a radio broadcasting studio. It is specially ventilated, lined throughout with a soundproof padding to eliminate all outside noises, and equipped with a cabinet-topped desk at which an operator—living, if you please, not mechanical—announces the time over telephone wires.

Atop the single position desk is a cabinet containing two sets of time equipment—one for regular use and one for emergency purposes. Each set includes a modified electric position clock, with the minute wheel divided into quarters showing the time in quarter minutes in advance of the announcement period, and a green frosted lamp which lights exactly seven and one-half seconds before the quarter minute point as a signal to the operator to start giving the time announcement.

In front of the cabinet on the desk is a specially designed microphone. Each time the green lamp lights, the operator begins announcing the time into the microphone, reading the exact time to the quarter minute as shown by the timer, or position clock, and saying, for example, "At the next tone signal the time will be (slight pause) twelve-forty and one-quarter." A second or two later the caller hears the tone signal, a high frequency spurt of sound.

The operator wears a headset receiver which enables her to hear the tone signal. She can also gauge the speed of her announcement so as to avoid overlapping the tone signal. Mounted on the cabinet are two meters for indicating voice volume. By observing the needle deflections on a meter, the operator can readily note whether her announcement is of the proper volume. By manipulating a key on the cabinet, she can raise or lower the transmission of her voice.

Under the present set-up, as many as 190 customers can hear the time operator's announcement at the same instant. This is possible through an arrangement for routing a large portion of the CAThedral 8000 calls from the originating offices directly to the time-of-day operating, without their going through the Dearborn "B" board. The time-of-day operator's desk circuit supplies six outgoing trunk lines, known as outgoing announcement circuits, which terminate in Austin, Stewart, Hyde Park, Irving, Lakeview and Rogers Park Offices. These six offices were selected as locations for local centers after observations showed that they originated the greatest amount of CAThedral 8000 traffic. In the equipment room at each of these offices there is a repeater circuit, connecting up with multiple equipment or trunks.

Here's how the system operates: Supposing a Hyde Park subscriber asks for Cathedral 8000. Instead of forwarding the call to Dearborn Office "B" board over an inter-office trunk, the Hyde Park "A" operator connects the subscriber with the Hyde Park local center equipment, which in turn is connected with the CAThedral 8000 equipment over the special trunk. Thus, several calls for CAThedral 8000 from customers in Hyde Park Central Office area may be routed to the time-of-day equipment over one trunk at the same time. This arrangement affords faster and more economical handling of calls.

Every piece of equipment associated with the time-of-day service that is susceptible to trouble is installed in duplicate, and a plant man is on duty day and night to prevent or quickly correct any possible trouble. Even an emergency microphone and operator's headset are kept in the time-of-day room. Should trouble occur on one desk circuit, the operator receives a lamp signal, so she can immediately switch to the reserve circuit and continue with her time announcements. The equipment is provided with alarm circuits which sound an alarm in the equipment room to indicate any failure of filament supply, tube failure, or any other circuit trouble which might cause interruption of service on one of the circuits. The alarm is given immediate attention by maintenance men.

Vacuum tubes are used throughout the circuit equipment wherever a boosting action is needed, or where the circuit design requires their use, such as to prevent cross talk or noise occurring when numerous customers receive the time announcement at the same instant, or to separate waiting customers from one another.

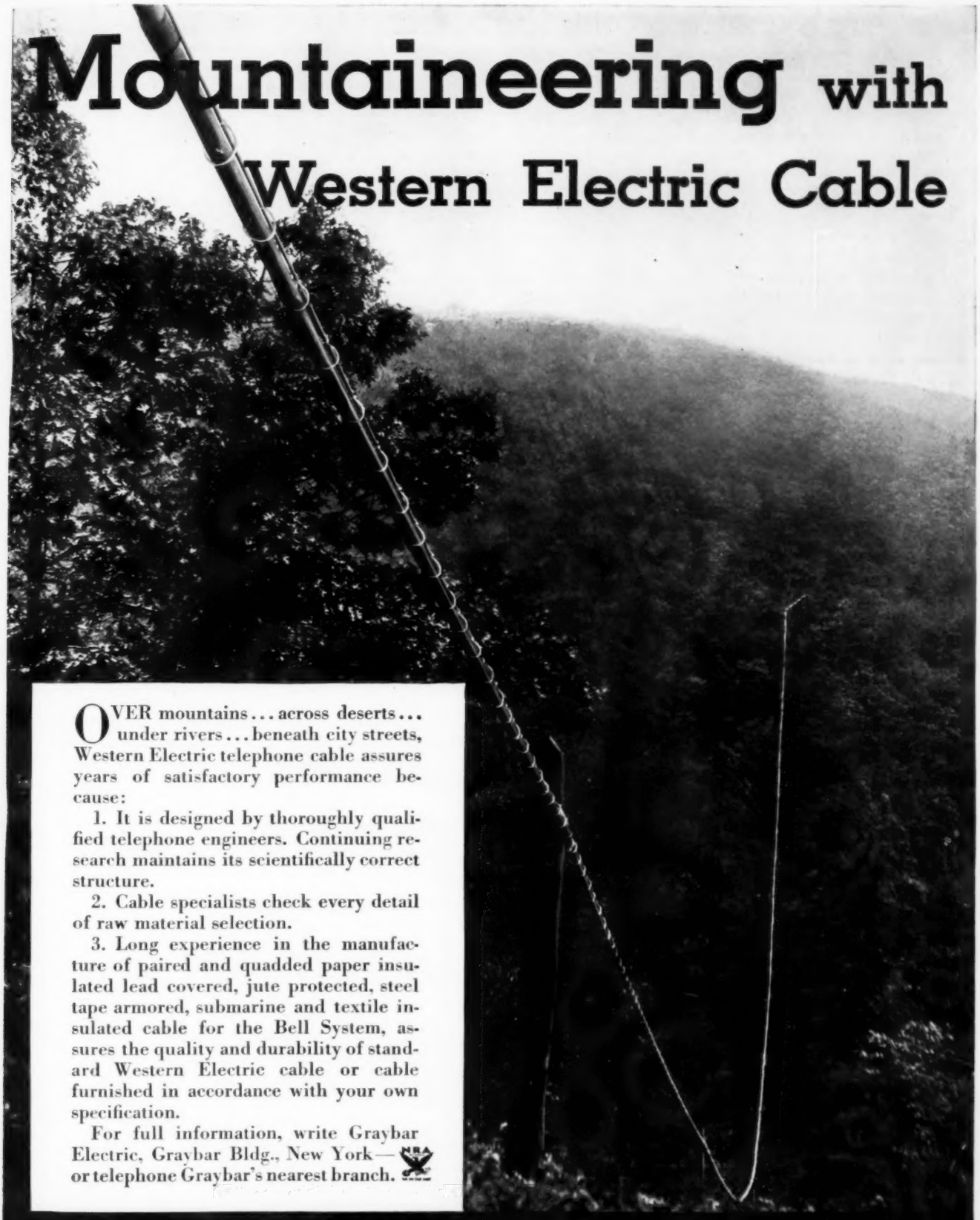
Steady increase in the time-of-day traffic from the day of its establishment in 1927 soon led to the installation of two outgoing announcement circuits terminating in outlying offices. Four more of these outgoing circuits were added at the time the locally designed time-of-day equipment was replaced by new A. T. and T. Co. standard equipment. This change took place coincident with the conversion of Dearborn Manual Office to dial operation January, 1931. The maximum single day's traffic, 52,000 calls, was recorded on September 29, 1930, when Central Standard time went into effect following the summer daylight saving time period.

NEBRASKA UTILITIES TAX VALUE CUT

Assessed valuation of telephone companies, reported to the Nebraska state tax commission this year, totals $17,215,012 as compared with $17,421,318 last year and $18,349,744 in 1932. Telegraph companies were valued at $1,339,532, compared with $1,314,973 last year. Foreign insurance companies were valued at $11,206,741, compared with $17,205,763 last year. Express companies are assessed at $51,986 compared with $58,525 last year. Pipe line companies are assessed at $6,000,509 compared with $6,320,041 last year and $7,180,948 in 1932. All personal property in the state is assessed at $471,691,274 compared with $475,039,381 last year and $555,295,533 in 1932.

Announcement has been made by the Western Telephone Corp. that the company has signed a ten year lease for the rental of the ground floor in the Hogan State Bank Building in Corning, Iowa, to be used for the telephone exchange. Possession of the building was made September 1 and work has begun remodeling the room and placing it in shape for occupancy as a telephone exchange. It is expected however, the actual change in location of the switchboard, office and other telephone equipment will not be completely made until about Nov. 1.

Mountaineering with Western Electric Cable



OVER mountains... across deserts... under rivers... beneath city streets, Western Electric telephone cable assures years of satisfactory performance because:

1. It is designed by thoroughly qualified telephone engineers. Continuing research maintains its scientifically correct structure.

2. Cable specialists check every detail of raw material selection.

3. Long experience in the manufacture of paired and quadded paper insulated lead covered, jute protected, steel tape armored, submarine and textile insulated cable for the Bell System, assures the quality and durability of standard Western Electric cable or cable furnished in accordance with your own specification.

For full information, write Graybar Electric, Graybar Bldg., New York — or telephone Graybar's nearest branch.

Western Electric

LEAD COVERED CABLE AND TELEPHONE APPARATUS

Distributed by GRAYBAR ELECTRIC CO.

GRAYBAR BUILDING, NEW YORK, N. Y., *Offices in 74 Principal Cities*

NEWS OF THE MONTH

Telephone selling in the United Telephone Company of Missouri did not stop with the close of the spring campaign May 1. On May 15 a Net-Gain Campaign started with all exchanges and employees participating to cover a 90-day period.

To make the Net-Gain Campaign a real sporting event, an 8-team baseball league was organized comprising the various areas in which the company operates. Hits, runs, yes and errors, too, maybe, were numerous, resulting up to June 25 in the installations of more than 300 telephones and a net gain for all the districts except one.

The Northwestern Bell Telephone Co. of Dubuque, Iowa, has awarded a $10,000 contract for construction of a garage, L. A. Nordin, manager, announced.

The replacement of a large part of the open wire telephone plant in Yuma, Colo., with aerial cable has been completed, according to Mrs. Catherine E. Cavanaugh, manager here for the Mountain States Telephone and Telegraph company. The improvements cost $6,500.

Conrad's, Iowa, telephone system has been much improved recently. The Central Iowa Telephone Company has practically rebuilt the entire system. A crew of men has been employed here for several days stringing new cables and lines and installing new poles. The complete change from the old lines probably will not be made until October.

J. B. Todd, manager of the Ozarks Central Telephone Co. announces that telephone service has been completed to the ferry south of Versailles, Mo., connecting with Green Bay Terrace, Ayes' Cottage Camp and other points in that area.

Frank V. Newman has assumed duties as commercial manager of the Michigan Associated Telephone Co., at Muskegon. Mr. Newman is acquainted in western Michigan telephone circles, having at one time been with the old Citizen's Telephone company of Grand Rapids. The new commercial manager succeeds E. I. Malone, who is being transferred to the parent company's Madison office, general commercial department.

Extensive improvements which will necessitate the expenditure of $10,000, are being planned by the Ohio Telephone Service Co. for Shelby county towns, including Sidney and Ft. Loramie, according to the announcement made Monday by H. G. Kerlin, district manager of the company for Shelby county.

The improvements will be both to the plants and central office equipment. A complete new power plant, including storage batteries and associated charging equipment to be installed in the Sidney exchange. This will allow for a constant predetermined voltage to be placed on automatic equipment, and will eliminate false signals, numbers, etc.

Sale of the Suring and Kendall (Wis.) telephone exchanges forming the property of the State Utilities Co. for $13,500 was approved by the Wisconsin Public Service Commission.

J. Samuel Hartt, Madison consulting engineer, is receiver for the company's property, and he negotiated a sale of the Suring exchange in Oconto county to the Commonwealth Telephone company for $6,500, and the Kendall exchange in Monroe county to W. B. Davis and Joseph A. Nozy for $7,000.

Lightning set fire to the switchboard at Wisetown, Ill., August 15. The fire was extinguished before much damage resulted.

Damage to telephone cable in the amount of $1,000 and a fire in a clothing store at Monticello, Ill., resulted when an automobile collided with a pole belonging to the Illinois Commercial company dropping a cable across an Illinois Terminal Railroad 550 volt feeder.

The public service commission approved the purchase of the Clear Lake (Wis.) telephone lines in Polk county by Julius C. Anderson and L. A. Campbell for $10,000. The utility is owned by Charles Holliday and serves about 330 subscribers in and near the village of Clear Lake.

Charles F. Tonn died at Quincy, Ill., August 25. Mr. Tonn was one of the organizers of the Illinois Telephone company at Jacksonville. He later owned telephone property at Jasper, Florida, and Scottsboro, Ala.

George H. Young, A. O. Swanson, H. Bergsten and J. O. Hale have purchased the Cleburne telephone exchange from the Kansas Telephone Co. The Kansas company has applied for permission to close the exchange and connect subscribers with the Irving exchange.

New central office equipment and telephones were cut into service August 20 at the Oakland exchange of the Illinois Southeastern Telephone Co.

Improvements in the Mt. Carmel, Ill., central office building of the Illinois Commercial Telephone Co. are under way. The front fire wall is being replaced and the rooms arranged and redecorated.

An installation of automatic equipment at Marshall is announced by the Wabash Telephone Co. The work is expected to be completed the latter part of this year.

Contract for a five room telephone exchange building in Belle Glade, Fla., will be awarded soon, it is announced by the Southern Bell Telephone Co. The new telephone system will serve the towns of Belle Glade, Chosen and South Bay.

The Ohio Community Telephone Co. of Cadiz has asked the state utilities commission for authority to suspend until next January 1 its charge for transfer and re-connection of telephones. The company stated in its application that it considered the present time right to approach the many customers who discontinued their telephone service in the past three years relative to a restoration of service, and wishes to avoid charging them for re-connecting the telephones.

At a chattel mortgage sale, D. E. McGregor of Gibbon, Neb., purchased the Comstock, Neb., telephone company, the consideration being $2,580 plus the delinquent taxes, which were in the neighborhood of $660. Mr. McGregor is not a stranger to the telephone business as he owns the exchanges at Ansley, Arcadia, Berwyn, Gibbon, Shelton, and now Comstock, and also an interest in the Sargent exchange.

L. E. Winget, of Baxter Springs, Kan., in charge of telephone properties in Kansas, Missouri, Arkansas and eastern Oklahoma, has been elected as vice-president of the Kansas State Telephone Co., with headquarters in Baxter Springs.

Another storm at Jacksonville, Ill., August 10 caused extensive damage to the temporary work of the Illinois Telephone Co. following the severe storm about a month previous. About 1500 telephones were put out of service.

EXPERIENCE IS A GREAT TEACHER —

HEAR YOU HAD A BAD STORM OVER YOUR WAY YESTERDAY, MAC, LOSE ANYTHING?
NO! EVERYTHING TESTED O.K.- REMEMBER WHEN THAT TRUCK BROKE THE POLE ON 72- AND THE HOT STUFF CROSSED UP WITH ME? I RESOLVED THEN TO PLAY SAFE AND INSTALLED SUB-STATION PROTECTORS.
WHAT KIND MAC?
COOK-O-TYPE - IT DOESN'T COST MUCH, IT IS EFFICIENT AND THERE IS PRACTICALLY NO MAINTENANCE. YOU CAN MOUNT IT IN-DOORS OR OUT-DOORS- MY MEN LIKE IT.
I'M SOLD ON COOK-O-SUB-STATION PROTECTOR, JIM. I TELL MY SUBSCRIBERS WHAT IT IS FOR, HOW IT IS DESIGNED TO KEEP DESTRUCTIVE LIGHTNING AND POWER CURRENT OUT OF THEIR HOMES AND KEEP THEIR LINES CLEAR—
THAT'S A NEW ONE ON ME, MAC, BUILDING GOOD WILL WITH A SUBSTATION PROTECTOR
IT IS NOT ONLY GOOD WILL, JIM IT'S GOOD BUSINESS. I'M PROTECTING MY PROPERTY AS WELL AS MY SUBSCRIBERS, AND I'M COMPLYING WITH THE LAW, AND THE LAW IS A GOOD THING TO HAVE ON YOUR SIDE ALL THE TIME.
THAT'S GOOD LOGIC MAC.

Mac is right.

Cook "O" type sub-station protection IS good business. The initial cost is small. Installation simple. Maintenance consists of routine inspection since the True Gap Dischargers WILL NOT PERMANENTLY GROUND THE LINE. You protect your subscriber, yourself, and your stockholders. Ask your jobber's salesman or write

COOK ELECTRIC COMPANY
2700 Southport Avenue Chicago

LEICH SWITCHBOARDS

Central Battery and Magneto

LEICH switchboards are modern in appearance and equipment.

New materials and careful engineering are responsible for the high efficiency characteristic of LEICH switchboard apparatus.

Long life of all parts subject to wear is assured by the correct choice of materials.

LEICH switchboards are favorably known for the accessible mounting of all equipment.

Investigate LEICH switchboards before buying.

LEICH ELECTRIC CO. - Genoa, Ill.

RAMBLEGRAPHS

By J. A. Smith

ARTHUR S. CAMPBELL

As mentioned in a former paragraph of Rambler, lives a pioneer who really pioneered; he is Arthur S. Campbell and he is living up in Cherryville, Maine. Retired! You guessed it.

* * *

Way back in the lord only knows when, Campbell began his work with the A. T. & T., or maybe you would call it Alexander Graham Bell, for Campbell was about the first construction foreman in the United States — even pioneering the lines across the continent before telephoning was heard of in many parts of the country. And he still lives to enjoy the luxury which was described as an extravagant plaything but which is now the greatest necessity of the century.

* * *

From Long Island to Long Beach and from Maine to Mexico, Arthur Campbell has labored in good and bad weather, overcoming difficulties which seemed unsurmountable. Trouble in almost every form confronted him in his work—things that the present day construction crews know absolutely nothing of and would give up without a struggle; but not Campbell.

* * *

Being an engineer and superintending the work laid out for him was a small part of his work. Overcoming transportation worries, dodging irate citizens who objected to having poles placed on their properties, parleying with railroads objecting to having lines cross their right-of-ways, arguing with sheriffs and city officials who dared him to place poles on streets and highways, were only a part of the day's work.

* * *

In almost every county it was his job to resist court action before he could proceed with the work. Playing attorney, diplomat and "bully" were incidents which happened continuously and which made the job more enticing to many of his helpers who enjoyed a scrap more than anything else. While the work was slow and tedious Campbell felt it was essential and so he kept right on year in and year out.

* * *

Poles had to be cut, prepared and transported by the construction crew in most instances, for where poles were needed the railroads had not been pioneered to that extent of furnishing facilities for handling such. True we had trains in those days, but the railroads did not extend to where the telephone company wanted its line. Railroads dodged valleys and marshy swamps, but it was found advantageous to place wires where towns and cities were, whether in the lowlands or the southern borders of the United States or the prairies and deserts of the west.

* * *

Beginning his extensive work of construction probably was in Long Island, New York, where it was felt that service was needed most. Those who know Long Island know of the great stretches of water-level country, unprotected from sea tides and high winds. Getting poles on the ground was one of the difficulties; getting them raised was another. A serious handicap in those days consisted of the crude equipment provided for the work. This consisted mostly of spades, shovels and pickaxes. Rearing a pole was nothing more nor less than physical strength.

* * *

Another difficult feat which Campbell pioneered was crossing the southern borders of Alabama, Mississippi and Louisiana. Mobile Bay probably was one of the biggest problems for it meant setting poles in water for quite a distance. Placing these poles and bracing them would be an interesting feat in these days of modern construction, but when the poles had to be floated into position, placed upright and guyed, it was a job to engage the wits of the best of minds. Tides as well as storms had to be contended with then as well as they do now. But the work was accomplished.

* * *

Construction of lines thru Northern Texas perhaps caused Campbell more concern than any other section because it was here that he encountered most of his court orders and injunctions, for Texas was then sparsely settled and communication by telephone was looked upon with distrust by many, while other localities invited and desired the new invention of speech. Railroads resisted telephone lines crossing their properties as a hazard which they claimed was unnecessary and unworkable.

* * *

Striking straight across the country from east to west next engaged the engenuity of Arthur Campbell, for this route was the longest and most tedious yet encountered. It meant pioneering thru the mountains of New York and Pennsylvania, the prairies of the middle west, the snow clad mountains of Colorado and the desert of Arizona and California. Large numbers of poles had to be transported by mule teams, which meant days of struggle even before the work of setting poles was thought of. How these difficulties were overcome would take pages of this publication, but they were interesting.

(Please turn to page 38)

—Cartoon by Roy Franklin Smith

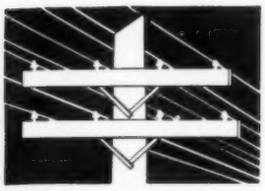
GENTLEMEN, MEET THE RAMBLER

We knew it was bound to come; just naturally felt it in our bones that one of these days someone would try to depict Rambler on his rounds in cartoon. Well, it happened, and above we reproduce the brainstorm that struck Rambler Junior recently. Junior has been practicing for only a few months but he grows more venturesome as his ability to show in pictures the ideas that come to him from time to time. Junior saved his scalp by showing some of the non-characteristics of the real article and thereby leading the public to see only what Rambler might have been. The hum of the above car will act as a theme song for Ramblings in future issues. Thanks.

* * *

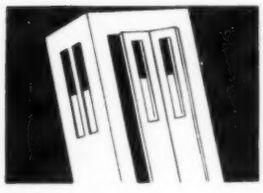
At last, a cool spot has been found. When visiting with R. S. Manley of the Texas Creosoting Company, and his able assistant, C. M. Tilley, the writer found that the banks of the Sabine River cannot only be cool, but very beautiful. To all of you who have been suffering with the "Great American Drought," would suggest your manufacturing some excuse to call on the makers of the Black Beauty products at their home office in Orange, Texas. Being an old Navy man, Mr. Manley seems to fit the spot better than anyone we could think of, and incidentally, the writer thinks it would be a good idea if he would go down again and get some pointers on salt water, as far as sailing is concerned.

FOR EVERY TELEPHONE NEED..



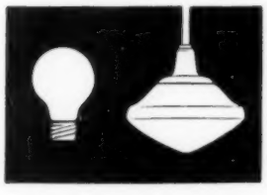
LINE MATERIAL... A single insulator. Or miles of pole line. Graybar can supply construction materials and tools for *any* telephone need. Quickly and economically.

EXCHANGE EQUIPMENT... Exchange equipment of many types is readily available from Graybar. Equipment from Graybar is standard, quality equipment. Write for more detailed information.



OUTSIDE EQUIPMENT... Equipment used outside of the exchange can also be had from Graybar. Note:—you'll find a Graybar distributing house right in your vicinity.

LAMPS AND LIGHTING... Good lighting is essential to good telephone service. Graybar's line of fixtures and glassware is unusually complete and up-to-date. Let a Graybar lighting specialist advise you.



EVERYTHING ELECTRICAL... Graybar, with its 65 years of experience, stands out as the logical source of anything and everything electrical. Write us for information on electrical supply problems.

..60,000 electrical items

GraybaR

ELECTRIC COMPANY

OFFICES IN 74 PRINCIPAL CITIES. EXECUTIVE OFFICES, GRAYBAR BLDG., N.Y.

In key with TODAY'S ECONOMY MEASURES

Every TOLL CALL *is "well in hand."*

TODAY more than ever before the telephone engineer is thinking out his problems in terms of economy—and Calculagraph engineers are right in step!

Toll records PRINTED with ELAPSED TIME TO THE SECOND—that is Calculagraph's contribution.

The new Model 30 is equipped with a self-starting, synchronous motor for 60 cycle, and either 20 or 100 volts regulated, alternating current. The mechanism is so designed that it can be fitted to the Model 6 spring-driven Calculagraph at a reasonable cost.

Sample imprints sent anywhere in the world on request. Please state the serial numbers of Calculagraphs now in use in your exchange, and estimates for converting them to the Model 30 will be furnished.

THE CALCULAGRAPH COMPANY
50 Church St. Dept. 22 New York City

CALCULAGRAPH
THE ELAPSED TIME RECORDER

HOW TO RUN BETTER SALES CONTESTS

(*Continued from page* 21)

branch or department against another you are running on a team basis, but even when a contest is used within a group, team scoring can be used. One way to divide to men is to pick the leaders first and let them choose sides. Another is to match the newer men against the old ones, on a handicap basis.

Team scoring need not interfere with individual contestants. The two can be handled simultaneously, with one prize for the winning team and the other for the high men in your organization. An extra set of prizes can be given to the high men on each team.

Men will often respond better to a team appeal rather than an individual appeal. The element of contagion is greater when the men are united. The element of secrecy is lacking. Men who might be bashful about acting boyishly in their own personal interests will often be glad to have a chance to loosen up on the pretext of doing it for the other fellow.

George Graf, who has run many excellent contests, has pointed out the general advisability of running team contests on a falling curb and individual contests on a rising one. He points out that when business is good most of the men make a good showing, but when it is bad the results are liable to be so bad as to discourage everyone. To meet this mental hazard Graf runs team contests, knowing that the total figures for groups of men will not give away the poor condition of sales.

Scoring Charts

In planning the scoring unit of motion of your progress chart you must take into consideration the psychological effect on your men of the picture they will see. Lay out your progress chart and plan your scoring unit so that the race seems to be moving quickly. Use a big chart; eight or nine feet in width is not too much. Use big numbers to make the recording; never use small numbers; use 1,000 or 10,000 as a final goal, and remember that big numbers are not more expensive than little ones and create more interest. Don't approach your sales contest with something of the attitude of the little boy whose father had a million billion dollars, "Why take less?"

The chart should be laid out so that the finish line is crossed without undue waiting. If the chart gives the appearance of a lagging contest then interest lags. Make the drive appear to be humming along at a great rate. Create the impression of motion. If the drive slows down too far increase your scoring ratios per inch on the charts and give for points per dollar sales. That will speed things up.

Play up your list of losers in groups. A contest is run primarily for losers, for the same reason that God is supposed to love the poor—there are so many of them, and the winners take care of themselves. When a list of contestants is a long one, the reports of the standing should be sub-divided so that each man has a reasonably obtainable goal. Success for all, or at least a little of it, should be right around the corner. The men near the top of the list are near the goal and the men near the bottom naturally want to get out of last place. In a boat race, for instance, classify your men as to captains, lieutenants, sailors, landlubbers. You will find that the men will want to get out of the group they are in, into a higher group, even if they are nowhere near the top of the list. In this way success, or a little of it, is just around the corner for every man.

THANK YOU

Have noticed with pleasure the recent improvements in *Telephone Engineer*. The new cover on the July issue, modern in appearance and descriptive.

Your editorial policy of cooperating with the industry and, the new technical articles for the small operating companies who cannot afford the service of trained engineers are appreciated and excellent. The monthly telephone station barometer is timely and renews our hopes of a greater telephone industry.

The quality of paper and typography are a great improvement, in fact, we congratulate you on the fine appearance of the new *Telephone Engineer*.

A. C. REID, Sales Mgr.
Leich Electric Co.

It seems that you continue manipulating the appearance and general make-up of *Telephone Engineer* to such an extent that some of your old-time friends are absolutely forced to extend congratulations to you occasionally, and that is just what I am writing you about now.

The good clean appearance of your cover page of the last two issues of *Telephone Engineer*, I think, deserves special consideration and comment. The fact that they do not carry advertising and that the issue in the first departure from the old appearance was really artistic, causes me to again say that you have made another step forward, and that the appearance as well as the reading matter has been greatly improved.

Congratulations to you.

R. B. STILL.

I am writing to compliment you on the appearance of *Telephone Engineer*. The new cover, type, and paper make a more attractive appearance and more important than this is the fact that you publish articles and material of constructive help.

I think your work is very much appreciated and I for one want to congratulate you on the many improvements you have made on your magazine.

W. L. RUNZEL, Pres.
Runzel Cord & Wire Co.

FRANCE, RUSSIA ON SPEAKING TERMS

France and Russia are on speaking terms again—telephonically. Long distance service between Moscow and Paris, broken off at the start of the Russian revolution in 1917, was resumed Aug. 31. Officials made a ceremony of the event. In Moscow Maxim Litvinof, commissar for foreign relations, spoke highly of France, and the compliment was returned from here by Andre Mallarme, minister of communications. Foreign Minister Louis Barthou transmitted a friendly message to Russia.

OHIO RATE CASE

The Ohio Utilities Commission on Sept. 7 ordered the Ohio Bell Telephone Co. to refund approximately $12,000,000 to forty-four Ohio cities within 90 days and to pay interest on excess rates collected. The company stated it would carry an appeal to the Supreme Court for final adjudication.

Arguments on an attempt to appoint a receiver for the Ohio Bell Telephone Co. will be heard by the state supreme court Oct. 17. Common pleas court in Cleveland had moved to appoint the receiver, to distribute $800,000 in refunds, when blocked by temporary injunction.

GENERAL SWITCHING PLAN

(Continued from page 17)

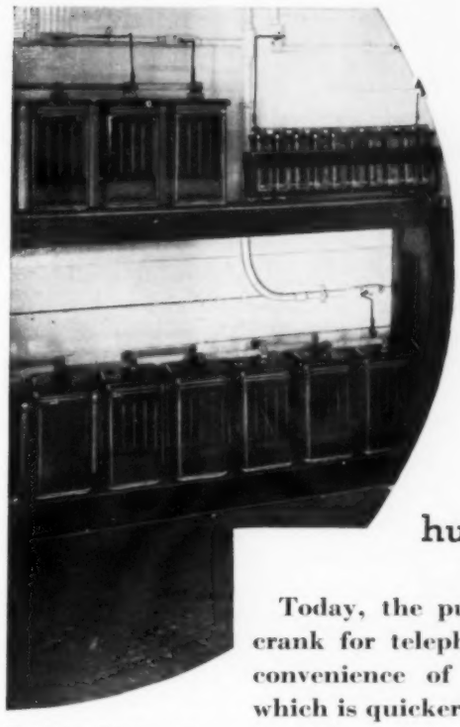
The primary outlets were selected after a careful study of the present switching and operating conditions and the probable development of toll traffic within the various areas with a view to obtaining the minimum number of primary outlets capable of handling the traffic economically. The routings provided by the plan are supplemented by direct circuits, or by other routings where the amount of business justifies such additional circuits as indicated by the dashed lines in Fig. 1. In general the requirement is made that these supplementary routes shall be at least as satisfactory, both as regards number of switches and transmission, as the routes provided by the fundamental switching plan. However, when the supplementary routes are used only as alternates to a primary routing they may be somewhat less satisfactory in these respects.

The tentative selection of primary outlets is shown in Figure 7. It is interesting to note that it is found practicable to take care of switching for the 2,500 toll centers of the United States and eastern Canada by the establishment of approximately 150 of these as primary outlets.

For handling the business throughout the country eight of the primary outlets are designated as regional centers, which are indicated in Fig. 3. The method of routing calls is indicated by Fig. 2. Each primary is connected with at least one regional center and with as many more as practicable. Each regional center is directly connected to every other regional center in the country. By this means, any one of the primary outlets, which are the 150 most important switching centers in the country, can be connected to any other primary outlet in the country with a maximum of two switches and within the area served by a regional center with a maximum of one intermediate switch. As an illustration of the concentration of switching which results, New York serves as regional centers for the entire northeastern section of the United States and eastern Canada.

(To be continued in October)

Fifty years ago Louisville, Ky., boasted of the fact that it had as many as 1400 telephones. Today, the city has approximately 53,000 telephones.



The Ogden Telephone Company, Spencerport, N. Y. use Exide Common Batteries in connection with their 3 position Stromberg Carlson multiple switchboard, serving 410 lines.

Nobody Likes A Crank

human or mechanical

Today, the public doesn't want to turn a crank for telephone service. They want the convenience of modern telephone service—which is quicker, clearer and more dependable as well.

Modern telephone service requires modern exchange equipment with its common source of battery power. For such service you cannot select a better battery than an Exide.

Exide Batteries assure absolute dependability. They deliver the power when it is needed most—in emergencies. Furthermore, the operation of Exide Batteries used in common service will not be interfered with by interruptions or fluctuations in the A-C circuits. During emergencies they will keep the majority of your lines in service.

There is an Exide Battery for every telephone job whether it is common service, emergency reserve, signalling or P.B.X.

Wherever the utmost dependability, long-life and freedom from care are the determining factors in the selection of batteries for telephone service Exide Batteries are invariably selected.

NRA CODE

Exide
BATTERIES
FOR EVERY TELEPHONE USE

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

COMMISSION GIVES MORE ORDERS

(*Continued from page 20*)

College, Sweet Briar, Va., in 1929. Graduated from Wake Forest Law School, Wake Forest, N. C., with LL.B. degree, summa cum laude, in 1932.

She was licensed to practice law by the North Carolina Supreme Court and admitted to the bar in 1931. Since that time she has engaged in the private practice of law in Louisburg, N. C. She is a member of the Committee on Legislation and Law Reform of the North Carolina Bar Association and has served as Secretary-Treasurer of the Franklin County Bar Association. She is also experienced in newspaper work, having served as press correspondent for the Raleigh *News and Observer* (Josephus Daniels' paper) and the *Durham Sun* of Durham, N. C.

ELIZABETH C. SMITH—Graduate of High School, Henryetta, Okla. Graduate of East Central State Teachers' College, Ada, Okla. Attended University of Oklahoma, Norman, Okla., and Emory University, Atlanta, Georgia. Finished Okmulgee Law School in May, 1929; passed Oklahoma State Bar examination in June 1929. Had an Okmulgee law office until March, 1931, when she entered the employ of the Corporation Commission of Oklahoma as law clerk to Paul A. Walker, Chairman.

During the period she spent in the law office in Okmulgee she had charge of general office matters, drafting pleadings, handling probate matters, drawing contracts, examining titles, and handling matters in court, in addition to briefing cases.

F. U. FLETCHER—Born in Sparta, N. C., in February, 1912. Attended Grammar School in Fuguay Springs and Raleigh, N. C. Graduated Hugh Johnson High School, Raleigh, N. C. Attended North Carolina State College, 1927-1929. LL.B. Degree, Wake Forest College, 1932. Attended Duke University Law School, 1932-1934. Admitted to practice of law in North Carolina in January, 1933.

MARSHALL S. ORR—Born at Klamath Falls, Oregon, November 27, 1899. Graduated from High School at Reno, Nev., June, 1917. Attended Pomona College in Southern California until enlistment in Spring of 1918. Student Flight Officer in Naval Air Force; discharged December 1918. Returned to college and graduated from University of California in 1922, degree of A.B. Degree of LL.B. from University of California in 1925. Remained out of school one year (1920-1921) and was employed as Supply Officer on the Western Division of the air mail service under the Post Office Department. This was the first year of operation of air mail over the mountain country.

Private practice in San Francisco 1925-28 and in Klamath Falls, Oregon, 1929-30. Took office as an attorney in the Bureau of Inquiry (prosecuting bureau) of the Interstate Commerce Commission at Washington, D. C., in February 1931, and has remained with that bureau until transferred to the Communications Commission.

HASSLER SECRETARY TO WALKER

John J. Hassler took the oath of office September 4 as secretary to Commissioner Paul A. Walker, chairman of the Telephone Division of the Communications Commission. He was born at Phillipsburg, Kan., July 12, 1906. His career, in brief, follows.

Graduate, Oilton Junior High School, May, 1911; graduate, Stillwater High School, May, 1922; attended Oklahoma A. & M. College, Stillwater, Okla., (Engineering School) 1922-23; 1923-24; 1924 and part of 1927. Employed by Wood Engineer Co., Oklahoma City, spring semester of 1925 and summer of 1925; attended school 1926-27; employed by Wood Engineering Co., consulting engineer, Oklahoma City, from June 1, 1927 to September 10, 1921; completed work for degree in the fall of 1921; B. S. degree in Civil Engineering, with several extra hours of college work in the engineering school.

Special research work for Oklahoma A. & M. College, from Feb. 15, 1930 to May 1, 1930, when he was appointed City Manager of Elk City, Okla., which position he held until June 15, 1931, when he was appointed gas and electric engineer of the State Corporation Commission of Oklahoma. Acting Secretary of Corporation Commission of Oklahoma from February to June, 1933.

He attended the Oklahoma City School of Law three terms, Sept. 1 to July 1, for each of the years 1931-32, 1932-33, 1933-34. He completed 18 of the 22 subjects required for the Oklahoma State Bar examination and is with the State Bar and eligible to take the examination in 1935.

NAME COMMISSION DIRECTORS

The federal communications commission has named directors of its three major divisions as follows: John Killeen of New York, director of the broadcasting division; Robert B. Bartley of Texas, director of telegraph, and A. G. Patter-

(*Please turn to page 42*)

Ain't It The Truth?

The Chicago Daily News

Professional Lineman's Pliers

LINEMAN'S FAVORITE
(Most popular size)
58-R—Length 8½"
Price $3.25
57-R — Length 7"
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REG. U.S. PAT. OFF.
Pliers

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IF WE were to take a thousand words to describe Vacuum Grip Professional Lineman Pliers, the story would not be half so convincing as *a single running test!* Instead of STATEMENTS it would give you actual RESULTS. It would PROVE EVERY CLAIM we have ever made about this remarkable tool — give you an ACTUAL DEMONSTRATION of its cutting power, gripping strength, all-around efficiency, versatility, durability and—of prime importance—its greater ECONOMY!

Purchasing Agents are urged, in their own and their companies' interests, to learn for themselves the actual facts by subjecting one or all of the pliers of the famous "R" Series to rigorous competitive tests.

Write us today for quantity prices and full particulars of our Demonstrating TRIAL OFFER. Don't put it off—write NOW!

FORGED STEEL PRODUCTS CO.
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OVER A MILLION VACUUM GRIP PLIERS IN USE

Coffing Hoists

"The Universal Tools"

Telephone Linemen Find the Model A COFFING HOIST Invaluable for Pulling Guy Wires, Messengers, Underground Cables, etc.

The Model A COFFING HOIST only weighs 14 pounds, is rated at ¾ ton and tested to 100% overload. Also made in 1½, 3 and 6 ton sizes.

We manufacture a variety of line equipment.

Catalog furnished upon request.

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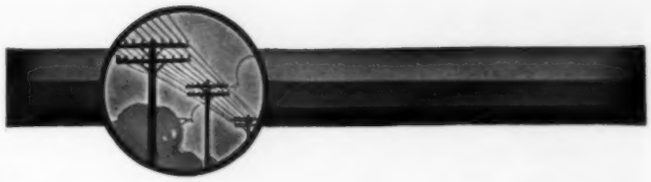
DANVILLE -:- ILLINOIS



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Both by repeated tests as well as under actual conditions of service, Phillips telephone cords show an extraordinarily low cost per year of service life. This is because of the exclusive method of construction used and the careful selection of materials with which they are built.

Everybody knows how ragged and frayed ordinary cords soon get. Phillips cords do not begin to show signs of wear until long after others have been discarded. They are covered with a newly-developed, tightly-woven material to form a compact, smooth, silk-like braid, which retains its attractive appearance even after years of hard service.

Phillips cords will not form a permanent kink. Thus another frequent source of wear is eliminated. And their insulation resistance is not only high to begin with, but remains high even under the most severe conditions.

For a new experience in cord economy, specify Phillips cords on your next requirements.

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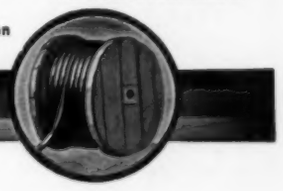

POWER LINE NOISE REDUCTION

(*Continued from page* 15)

tween Supply and Signal Companies has the following to say regarding single phase extensions from three phase lines: "Consideration should be given to the isolation of branch circuits consisting of less than the total number of wires of the main circuit, resulting in substantial balance, by means of transformers where such main or branch circuits are involved in inductive exposures."

In other words when power companies are contemplating making a single phase extension of a three phase circuit they should be urged by the telephone company involved to electrically isolate the proposed single phase tap from the three phase main line by means of a transformer.

The isolating transformer will eliminate the unbalanced capacities to ground of both single and three phase lines that would otherwise result. Fig. 6 illustrates how a transformer may be used to permit a single phase extension of a three phase line.

It is important to note that there are many existing single phase metallic extensions of three phase lines already in use over the country, hence, when power companies proposed to extend existing single phase lines, it would be advisable for the telephone company involved to check the origin of the existing single phase line to see if it is a metallic extension of a three phase main line. The greater the length of the single phase tap from a three phase line, the greater will be the unbalanced capacity and the resultant residual voltage.

To give a quantitative idea of the importance of maintaining balanced capacities to ground, the writer knows of one case where a three phase line twelve miles in length paralleled a number of grounded telephone circuits for approximately two miles. While some noise was induced in the telephone circuits, service was considered very satisfactory. The power company later made a ten mile single phase metallic extension from the three phase line and immediately the induced noise in the grounded telephone circuits increased to the point where was obtained by the use of an isolating service was very unsatisfactory. Relief transformer as shown in Fig. 6.

The telephone office at Cairo City, Nev., occupies the site where Adobe Stockade once furnished settlers a refuge from attacks by the Indians.

THANK YOU

I am pleased to note the continued improvement you are making in *Telephone Engineer*, and I commend you particularly on the design and appearance of the new cover. It is excellent and immediately conveys the impression that it covers a high class magazine.

H. L. HARRIS
Automatic Electric Co.

I wish to say that I consider the change in the *Telephone Engineer* quite an improvement and I wish you all kinds of luck.

W. H. BRYANT
Mobile, Ala.

We have been very much pleased with the improved appearance of *Telephone Engineer* and also its editorial content. We are confident it will prove of much greater interest to its readers and of course possess considerably more value to its advertisers.

N. W. JARVIS, Treasurer,
Calculagraph Company.

May I extend to you my sincere congratulations for a great piece of work. I am referring, of course, to the cover make-up of the June issue of *Telephone Engineer*. In my opinion it marks a definite step forward for your publication.

Your new cover typifies *Telephone Engineer* for what it is—a modern, up-to-date and progressive magazine.

G. WALLINGTON, Stewart,
Hanford & Frohman Advertising Agency.

We congratulate you on the superior appearance of the *Telephone Engineer's* recent issues. The new front cover design is a marked improvement.

Wishing you every success in your endeavor to have your book meet a high standard, we are

N. W. AYER AND SON,
Advertising Agency.

Congratulations on the new cover of *Telephone Engineer*. It is in keeping with your high standard editorial content and inside appearance. The improvements you have made mark *Telephone Engineer* as a progressive telephone journal, more valuable to readers and advertisers.

AARON SMITH
Former Publisher
The Transmitter

RAMBLEGRAPHS BY J. A. SMITH

(*Continued from page* 32)

When we pick up our telephone to talk across the continent we little think of the difficulties of pioneering in order to bring about this service. This work was left to our fathers as was the work of building railroads, highways, and other necessities. We only look for the conveniences of today and think little of the hardships of other days.

* * *

Yet up in Cherryville, Maine, sits one who looks with pride upon the part he played in bringing service and pleasure to a nation, watching an industry grow from a few hundred telephones to a peak of twenty million stations. Arthur Campbell still enjoys good health, takes an interest in the civic progress of his own town and enjoys life as only a pioneer who has seen his dream come true can enjoy it.

* * *

Rambler ambled down through Iowa and Missouri during August, stopping here and there seeking information. And was it hot! Say, Dante's Inferno would have been a recreation resort, in the minds of some. 'Tis said some of the telephone people were using melted solder for dessert. Well, any way, fall months have brought relief in the form of cooler days and rains have also helped. Indications, however, show that the drought was not as widespread as believed.

LINE & DESK: QUESTIONS AND ANSWERS

(*Continued from page* 22)

exert the necessary magnetic pull to ring the bell. The omic resistance of the ringer coils, as far as talking currents are concerned, is of small importance as the impedance of the coil on account of its reactance being much higher to voice frequency currents than the omic resistance. The winding space of most ringer coils is about the same, and this determines the number of turns that can be placed on a coil with a given size of wire. Therefore, the specifying of the resistance to which coils are wound is a convenient and satisfactory designation of the winding.

NEW RURAL RATES IN ILLINOIS

Revenue of the Illinois Bell Telephone Co. will be reduced more than $5,000 annually as the result of a new rate schedule which became effective Sept. 3 on rural lines. The new setup allows rural subscribers to install desk sets in their homes at an additional cost of 25 cents a month, with the charge to be eliminated after three years.

Heretofore, the 25 cents was charged with no limitation as to time, George H. Shafer, rate expert of the Illinois Commerce Commission said. Many rural subscribers already have used the desk sets for three years and will no longer pay the additional charge. The cost will be removed from bills of other users as soon as the period is completed.

One interruption of not more than 90 days shall not be considered a discontinuation, the schedule says. Subscribers in hundreds of Illinois cities and towns, including Springfield, Cantrall, Riverton and Rochester, are effected by the new rate.

HIGGINS BUYS PROPERTY IN MISSOURI

Under an order of approval issued by the State Public Service Commission, the telephone exchange at Pacific, Franklin County, will be transferred from the assets of the bankrupt North Central Telephone Co. to the ownership of P. K. and Gertrude E. Higgins of St. Louis.

The sale was made by R. B. Caldwell, trustees in bankruptcy, with approval of the Federal Court for Western Division of Missouri and Fred S. Hudson, referee in bankruptcy. The price paid for the property is $7000 and the purchasers assumed operation of the exchange August 10.

CANADIAN MEETING

The 29th Annual Convention of the Canadian Independent Telephone Association convenes in Toronto, October 18 and 18, at the King Edward Hotel. Present reports indicate a good and representative attendance of members and non-member companies of the Association.

George W. Ocobock, of Norwood, Minn., died at his home in Norwood August 24 at the age of over 73 years. He passed away following a brief illness, and was active in business until the time of his demise. During recent years Mr. Ocobock associated with the telephone business.

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GALVANIZED PRODUCTS

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MEN in the field recognize the outstanding advantages of *Crapo* Galvanized Telephone Wire and Steel Strand. They know from experience that these dependable products can be spliced without injury to the heavy, *pure* zinc galvanized coating; that they are easily and quickly served; that they last longer in actual service under all conditions. For long life and low maintenance costs, specify genuine *Crapo* Galvanized Wire and Strand on all new and replacement jobs! Their superiority in actual service is a matter of record in the engineering offices of some of America's leading public service companies.

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TELEPHONE BIG AID TO GOVERNMENT

Interest in agricultural pursuits in more than 4,200,000 telephone calls being made through the private branch exchange switchboard serving the Department of Agriculture in Washington during the fiscal year ending June 30. This government department with its 10,600 employees is served by approximately 3,000 telephones.

Without the modern quick-action tele- United States Department of Agriculphone the emergency activities of the ture would have been immeasurably slowed down according to J. L. Koehl in charge of telephones and telegraph. More than half of this great volume of calls—4,200,000—were made within the office of the department, which is an indication that it is a pretty busy place even without the telephone calls from the outside.

The number of incoming calls is nearly double those outgoing, the approximate figures being 1,341,000 as compared to 721,000.

Within the department there is always much need for quick exchange of information. Scientific or economic research, impersonal as it may be in reports, is an intensely personal activity. An intricate investigation may require quick information from half a dozen men, each an authority in his own field, and the telephone is used. It is of just as great importance to administrators of all department activities and to those who gather and distribute information on the current agricultural work.

While the U. S. Department of Agriculture is nominally the farmer's branch of the federal government, it actually works for all citizens and is in frequent and intimate touch with their daily affairs. The department is charged with from daily weather reports, through food a wide group of services that range and drug regulation, commodity standardization and inspection, to the building of highways used by all the people and the control and conservation of the National Forest which are the property of all citizens.

In emergencies the telephone serves department takes advantage of telephone well. There is never a year but that the service in major emergencies affecting thousands or even millions. This was true during the past year when extensive efforts were being made in production adjustment and in relieving drouth sufferers.

Operators in the department handle nearly one-third of all calls made. These consist of all incoming calls and all long distance conversations. Some idea of the way in which this work for operators has increased can be gained from the fact that the number of "positions" at the department telephone switchboard increased last year from four to seven.

"However," says Mr. Koehl, "I doubt if these facts and figures interest people much. They take the telephone for granted."

"But," says another department employee, "it may also be taken for granted that if anything happens to halt telephone service, you will hear from them as soon as they can get a call through."

STILL TRANSFERRED TO ILLINOIS

R. B. Still, Portsmouth, Ohio, has assumed charge of the Illinois properties of the Telephone Bond & Share Co. Mr. Still has his headquarters in Bloomington.

R. B. Still

Mr. Still is well known in the telephone field, having served for many years as general manager of the Gulf States Telephone Co., Tyler, Texas, as general manager of the Home City Telephone Co., and as vice-president of the Utilities Finance Corp., also of Tyler, Texas. He was president of the Texas Independent Telephone Association for a number of years prior to 1930.

In 1930 Mr. Still became associated with the Telephone Bond & Share Co. with headquarters in Kansas City, Mo. He was transferred to Portsmouth, Ohio, about two years ago, as operating head of properties in that section.

At the annual convention of the Ohio Independent Telephone Association held in Columbus last spring, Mr. Still was elected a director. He served as director of the United States Independent Telephone Association in 1930.

Mr. Still has been engaged in the telephone business for approximately 31 years. For 24 years he was connected with the Gulf States Telephone Co. and its predecessor, the Southern Telephone & Telegraph Co.

IOWA ASSOCIATION MEETINGS

District telephone meetings or conferences of the Iowa Independent Telephone Association will be held as follows:

Corning, Monday, September 17; Logan, Tuesday, September 18; LeMars, Wednesday, September 19; Odebolt, Thursday, September 20; Guthrie Center, Friday, September 21.

There will be separate meetings for the telephone men and for the operators at the telephone office beginning at 10:30 a. m. The women's meetings will be conducted by Miss Anne Barnes, working under the Engineering Extension Department of the College at Ames.

BELL GAINS 10,750 STATIONS

An increase of 10,750 telephones in service during August was reported by the Bell system. A loss of 20,750 was recorded in August, last year, and a loss of 33,500 in July, this year.

Further gains are expected in the remaining four months of the year, contingent, of course, upon general business conditions. This is based on normal trends, fall being considered the best season of the year from the standpoint of telephone station expansion.

It was reported that a sizeable gain is expected for 1934, with a net increase of 160,000 to July 31. Net losses of 630,000 and 1,657,000 stations were recorded in 1933 and 1932, respectively.

S. C. HEARING SET

The South Carolina state railroad commission set September 13 for a hearing on telephone rates of the Continental Telephone Co. of South Carolina in Bishopville. The hearing had been previously scheduled but was postponed to a date to be fixed later.

ILLINOIS CONVENTION

The 30th annual convention of the Illinois Telephone Association will be held in Peoria, October 18 and 19. A. J. Parsons is secretary of the association.

From about 300 telephones and one switchboard in 1884 to more than 67,000 telephones in 1934, with eleven central offices, is the record of Dallas, Tex., during a half century of telephone progress.

Unaffected BY SUDDEN TEMPERATURE CHANGES

● This improved, tougher Hemingray Glass—with its proven ability to withstand severe, sudden temperature changes—means better insulator service, lower costs. With the advantages of high dielectric strength ... heavier side walls ... thicker petticoats ... always clear ... smooth threads ... tougher glass ... impervious to moisture ... Hemingray pin-type Insulators offer greater economy in telephone insulator service. Write for samples and descriptive bulletin. Owens-Illinois Glass Company ... Hemingray Division, Muncie, Ind.

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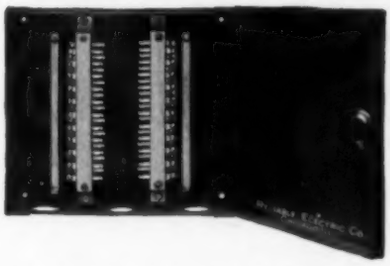

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Even Temperature

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GOOD JOINTS DEPEND UPON CORRECT SOLDER TEMPERATURE.

Accurate in gauging temperature, rigid in construction, convenient size.

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$1.50

While They Last

A limited supply of the MASTER 7-inch telephone lineman pliers. A BARGAIN YOU CAN'T AFFORD TO PASS UP.

Formerly sold for $3.50.

With a Master 7 a lineman carries a smaller and more convenient tool—but one that will do as much as any other 8-inch because of the multi-power head—a stronger and more durable tool—better balanced and handier working—easier on the wrists—greater power—and, in ordinary use, unbreakable. An all-around, fine article, in which there is continued pride of ownership and consequently an inclination to treat it as a plier should be treated.

OUR SUPPLY WON'T LAST LONG.
SO ORDER YOUR PAIR TODAY.

Dillon Manufacturing Co.

63 E. Lake St. Chicago, Ill.

SO. IND. T. & T. HAS HEARING

A hearing has been held before Carl Wilde, referee in bankruptcy, in Federal Court at Indianapolis, to determine the status of the trusteeship of the Southern Indiana Telephone and Telegraph Co. No objecion was made to the present trustee, George M. Barnard, and it is expected that recommendation will be made that he be continued.

The hearing was a step toward the reorganization of the company, which passed into receivership in December 1932, when Barnard was appointed receiver. The business continued in receivership until last July when Barnard was appointed trustee.

The reorganization is a financing move and will not affect the operation of the company. It involves a change of security. It is understood that the Goodrich interests which control several utilities throughout Indiana expect to become interested in the reorganization. The bondholders have until October 15th to submit their plans to the court.

BARBER APPOINTED BY WHITNEY-BLAKE

The Whitney-Blake Co. announces that Frank H. Barber will act as their western representative with offices in Chicago.

Frank Barber is well known in the electrical industry having been active for many years in electrical manufacturing and jobbing. In 1904 he entered the shipping department of Western Electric at Kansas City and was transferred to Oklahoma City, Salt Lake City, Dallas and finally to the New York general department. For several years, he has occupied the position of merchandising production manager with the Graybar Electric Co.

Frank H. Barber

Whitney-Blake wires and cords have been distributed exclusively through the Western Electric Co. and later through the Graybar Electric Co. to the telephone and electric manufacturing industries for over 33 years. Representation in the middle west, with headquarters at 500 S. Clinton St., (Graybar's Chicago office) will enable them to better serve their customers in that territory.

The mica used in the transmitter of telephones comes from mines in the hills of India.

COMMISSION GIVES MORE ORDERS

(*Continued from page 36*)

son of Alabama, director of telephone.

Mr. Killeen was contact man between the General Electric company and its holding companies for 15 years. From 1924 to 1933 he was publisher of a weekly newspaper devoted to the discussion of state and national subjects.

Mr. Bartley was placed in charge of the telegraph division as a result of his experiences in investigating the utilities holding companies as a member of the staff of a house committee. He was statistician for Dr. Walter M. W. Splawn during the extensive study of the ownership and control of the utilities.

Mr. Patterson's appointment also was partly as a reward for services performed for congressional committees. His latest work was a chief investigator for the senate committee investigating ocean and air mail contracts. However, he served for eight years, 1920 to 1928, as president of the Alabama public utilities commission which, according to estimates here, became one of the outstanding regulatory bodies in the United States.

SALES CAMPAIGN

In an effort to further stimulate the telephone business in Franklin and Bloomington, Neb., the employees of the Nebraska Continental Telephone Co., put forth extra efforts during the first two weeks in September for new subscribers. According to reports a substantial increase in new subscribers was added to the growing list as a result of this effort.

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By HENRY M. ROBINSON

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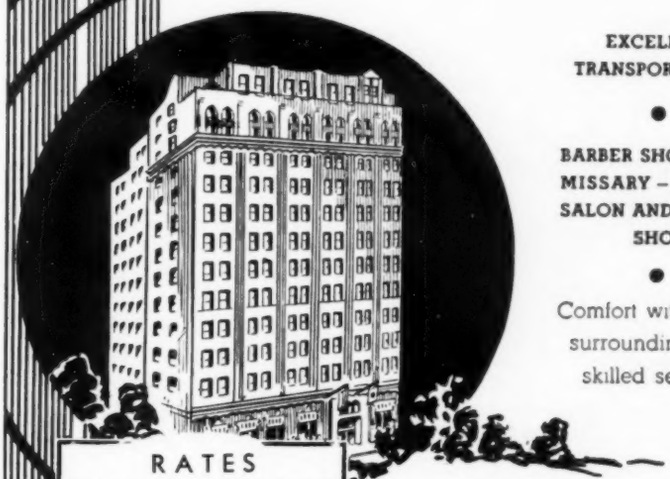

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ALL BRIGHT OUTSIDE ROOMS WITH COMFORTABLE BEDS . .

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ELECTROX RECTIFIERS
For charging storage batteries in Telephone Service or operating P-B-X, P-A-X, C-A-X Systems without batteries.
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Wall phones converted into desk sets. Highest grade of material and workmanship. Fully guaranteed.
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The
TELEPHONE REPAIR SHOP
Rogers Park Station, Chicago, Ill.
We Specialize in Rebuilding Transmitters

BETTER WIPING OF CABLE JOINTS

A cable foreman in one of the larger exchanges in Texas writes the Dillon Manufacturing Co., 63 East Lake street, Chicago, as follows:

"I had some of the best cable splicers in this city use your Dillon Temperometer in testing the temperature of wiping solder for wiping cable joints; we found by heating the solder to a temperature of 350° on the Dillon Temperometer we could wipe a better joint with more ease * * *. We found that over-heating the solder you burn the tin out of solder and make joints hard to wipe. We found that by the use of your Temperometer in wiping joints a splicer should only wipe one end of joint on large sleeves and heat his solder again for the other end; we find by this method we do not overheat the solder and burn the tin.

"I believe the Dillon Temperometer is a great help to any cable splicer and hope to see all companies use them."

E. A. SIPP NOW WITH BURGESS

E. A. Sipp, until recently manager of the lighting division of Pyle-National Co., has become associated with Burgess Battery Co. and C. F. Burgess Laboratories, Inc. Mr. Sipp will maintain his headquarters in the offices of the Burgess organizations at 111 West Monroe St., Chicago.

LITTELFUSE FOLDER

Littelfuse Laboratories, Chicago, recently issued one of the most interesting folders that have come to our attention. The folder entitled, "30 Times Finer Than a Human Hair Yet It Saves Thousands of Dollars" describes the platinum filament used in 1/100 amp. Littelfuse.

ISSUES BOOKLET

The Holtzer-Cabot Electric company has issued one of the most complete pieces of literature on ringing and interrupter equipment for telephone exchanges. The booklet is attractive and complete in its description of this type of equipment. Copies may be had by writing direct to the Holtzer-Cabot company, Boston.

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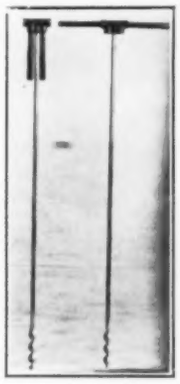
FOLDING AUGER HANDLE

The folding auger handle shown in the illustration accompanying this article is the product of the Coffing Hoist Company, Danville, Illinois. The handle is designed for compactness in handling and transporting with other tools, folding up so that it will not become entangled with tools and become wedged thus preventing easy access when necessary.



The handle may be used with the auger shown or may be detached and used with other similar tools. This auger is designed for use in frosted grounds and other kinds of earth, and has proven a wonderful success for temporary grounding of power transmission lines while they are being repaired.

FACTORY INSTALLS SOUND SYSTEM

Installation of a Stromberg-Carlson No. 4 sound service system has recently been completed in the Defiance Factory of the Reliance Manufacturing Co. at Bedford, Ind. W. Young, superintendent, reports that the equipment is working nicely and that everyone is highly pleased with its performance. Seven speakers, one of them two and one-half blocks from the main plant, are connected to the equipment, enabling all of the employees to enjoy radio programs as they work and during rest periods.

A microphone as part of the equipment enables the instantaneous broadcasting of emergency orders to the entire personnel, serves to broadcast programs, etc., during the various athletic activities of the organization, and saves much unnecessary delay and additional work that would otherwise be necessary.

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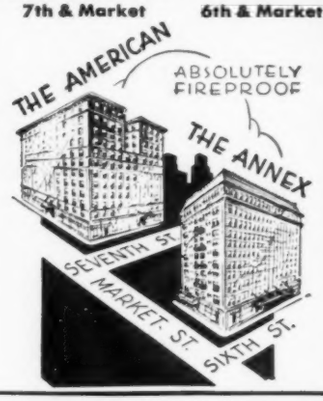

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